

DOCUMENT RESUME

ED 262 785

IR 051 295

AUTHOR Schrader, Alvin M.
TITLE A Bibliometric Study of the "Journal of Education for Librarianship," 1960-1984. Full Report.
PUB DATE Jun 85
NOTE 95p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Bibliographic Coupling; *Citations (References); *Content Analysis; Databases; Information Science; Item Analysis; Library Education; *Library Science; Research Methodology; *Scholarly Journals; Serials; Statistical Analysis

IDENTIFIERS *Bibliometrics; *Journal of Education for Librarianship

ABSTRACT

This study describes and evaluates key bibliometric patterns in the articles published by the former "Journal of Education for Librarianship" (JEL) during its first 24 volumes of existence from 1960 to 1984. Data from each issue of JEL were collected and analyzed using a statistical analysis software package, SPSSx (Statistical Package for the Social Sciences, Version X). Since becoming a refereed journal in 1971 (volume 12), JEL's scholarliness has increased dramatically--at least insofar as a quantitative indicator reveals. Before 1971, just more than half of all articles contained bibliographic citations. Since 1971, this proportion has grown steadily, and in the 1980s, 9 out of 10 articles were referenced. The number of citations per referenced article has also increased steadily, from 8 before refereeing to 17 in the 1980s. This article includes background information on the issue; a theoretical framework for studying bibliometric patterns; a review of the related literature; conceptual problems and definitions; explanation of data collection methods and procedures; study findings; and a summary and conclusions. Statistical comparisons, numerous data tables, codes, database exclusions, and project costs are appended. (Author/THC)

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A Bibliometric Study of the
Journal of Education for Librarianship,

1960-1984:

Full Report

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June 1985

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Abstract

This study describes and evaluates key bibliometric patterns in the articles published by the former Journal of Education for Librarianship (JEL) during its first 24 volumes of existence from 1960 to 1984. Data from each issue of JEL were collected and analyzed using SPSSx.

Since JEL became a refereed journal beginning with volume 12 in 1971, its scholarliness has increased dramatically--at least insofar as a quantitative indicator reveals. Before 1971, just over half of all articles contained bibliographic citations. Afterwards, this proportion grew steadily, and in the 1980s 9 out of 10 articles were referenced. The number of citations per referenced article has also increased steadily, from 8 before refereeing to 17 in the 1980s.

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A Bibliometric Study of the
Journal of Education for Librarianship, 1960-1984: Full Report

Statement of the Problem

This study addresses the question of what quantitative and evaluative statements can be made about the Journal of Education for Librarianship (JEL), now that it has completed 24 volumes of publication spanning the years from 1960 to 1984.' The Journal is the principle medium of formal communications in English for professional educators in library and information science, and it is the official publication of the Association for Library and Information Science Education (ALISE; formerly, AALS, the American Association of Library Schools).

The objectives of the present study are to investigate two clusters of questions about JEL during the period 1960-1984. The first cluster concerns the population of articles published by JEL during this period. Basic questions are as follows:

- o How many and of what length were the articles published by JEL?
What subject matter did they address? How often did they cite prior literature? Were they the product of author collaboration or of individual effort?
- o Who were the contributing authors, in terms of the variables below: occupational status, geographical location, gender, typical number of article contributions to JEL, and, author identities of highest contributors?

The second cluster of questions concerns the population of bibliographic

citations found in JEL articles over the study period, namely the following:

- o What were the bibliometric characteristics of cited works, in terms of: number, frequency, frequency per article page, age, publication format, and, authorship collaboration?
- o What were the titles of journals most frequently cited? What was their productivity in terms of citation yield?
- o What were the titles of the most cited publications? Who were the most cited authors and editors? What was the productivity of these respective titles, authors, and editors in terms of their citation yield?

Finally, what were the major shifts in these bibliometric variables over the study period from 1960 to 1984? In particular, did the adoption of manuscript refereeing in 1971 have a discernible effect on any of these bibliometric dimensions and on the scholarliness of the Journal? For the purposes of this study, it was hypothesized that a statistically significant difference would be apparent in the proportion of articles with bibliographic citations before and after the institution of the refereeing policy. The null hypothesis was that refereeing had made no difference at all in the proportion of articles with citations. Although there may have been statistical differences on other variables, there was no plausible theoretical justification for testing any of them.

Background to the Problem

In the summer of 1960, when JEL was launched as the official publication of AALS, it proposed to address an ambitious agenda of questions which it had inherited from its three antecedent publications:

What do they teach in library schools?
 How do they teach it?
 Who are the teachers?
 Who are the students?
 What do they know and do about research?
 What does the AALS think, and do, and say?
 What are related problems of education for librarianship abroad?
 How do the changing needs of libraries affect the education of librarians?²

The Journal indicated that answers would be sought through a combination of approaches: signed articles exploring different aspects of library education; surveys of writings about education for librarianship; reviews of dissertations and other research projects connected with library schools; an annual faculty directory; statistics about faculty and students; official reports of AALS activities; substantial reports of other associations concerned with education for librarianship including the annual report of the Committee on Accreditation; a quarterly chronicle featuring short new items, summaries of workshops and institutes, and a calendar of events; and, a forum for "letters of thoughtful comment on the contents of the journal and also on the broader issues of professional education".³

The Journal began by intermixing scholarly articles and occasional or regular columns dealing with some of the above topics.⁴ Commencing with volume 4, issue number 4, 1964, news accounts of conferences and meetings plus such aforementioned feature items were shifted to a general section entitled "Of Special Interest".⁵ Other columns, such as the "Teacher's Section" and a book review section entitled "In Review", were later added to "Of Special Interest".⁶

In 1967, Sam Rothstein, the President of AALS, called for a new approach to AALS annual meetings in which "scholarly, meaningful discussions of library science education" would be encouraged.⁷ Concomitantly, a more invigorating Journal was also envisioned.

Occasional editorial themes in the early volumes of JEL were of two kinds. One was a plea for a more responsive readership. In 1968, the editor wrote: "Last month we received one communication. Is anyone reading this journal?"⁸ The other theme was a somewhat qualified invitation by the editor for more substantive manuscript contributions: "thoughtful material (footnotes and all), but let it be truly intellectual and not inane".⁹ Sometimes the invitation was simply for more submissions.

Notable departures in JEL editorial policies and practices occurred with the first issue of volume 12, in the summer of 1971.¹⁰ At that time, JEL became a refereed journal. Manuscripts were to be reviewed not only by the editor but also by two or more experts who would be selected by the editor normally from the ranks of the editorial board or, on occasion, from the AALS membership. At the same time, members of the editorial board became official advisors to the editor and through that office to the Association's board of directors.

Also at that time, in order to ensure greater security of tenure and more editorial independence, the editor was given a fixed length of appointment, after which renewal was to be at the option of the Association's board of directors.

Since the Spring 1977 issue, formal "Guidelines for Authors" have been published once a year. Four types of contributions considered acceptable for

publication in the Journal were described in the 1977 announcement:

Major articles of approximately 3,000 words: scholarly papers relevant to library and information science education; papers with quantitative evaluation of teaching methods; state-of-the-art reviews in the field; reports of studies pertaining to library and information science education, highlighting results and implications; and reports, with supporting data, on such topics as manpower, student admissions, student retention, placement, continuing education and non-traditional study; etc.

Brief communications of 1,500 words or less: papers reporting unique ideas that have been applied to teaching library and information science courses; novel use of a teaching method or teaching aids; motivational techniques, etc.

Reader comments of 850 words or less: brief statements of opinion, of divergent viewpoints, or constructive criticism.

Guest editorials of 850 words or less: cogent points of view on topics of exceptional and timely interest to the profession.¹¹

The editorial policy of the Journal has been remarkably consistent over the years. The first formulation appeared in volume 1¹² and remained unchanged until volume 12, summer 1971.¹³ The contemporary statement of editorial policy appeared in volume 17, spring 1977.¹⁴

Another factor which may have contributed to the stability of the Journal editorial policy is that there have been relatively few changes of editorship. Only 5 editors have served during the 24 years under study:

Harold Lancour, 1960-1964

William A. Katz, 1964-1971

Norman Horrocks, 1971-1976

Lucille M. Wert, 1976-1980

Charles D. Patterson, 1980-date.

Some additional current facts about JEL are the following:

1. Manuscript contributions

- 1981 - 66
- 1982 - 53, including 11 from authors outside the U.S.A.
- 1983 - 43, including 8 from authors outside the U.S.A.
- 1984 - 49, including 8 from authors outside the U.S.A.¹⁵

Manuscript acceptance rate: approximately 25%¹⁶

Notification to manuscript contributor: 6-9 months

Publication time lapse after notification: 6 months¹⁷

2. Secondary access¹⁸

Current Contents
Education Index
Educational Resources Information Centre
Index to Journals in Education
Library and Information Science Abstracts
Library Literature
Social Sciences Citation Index

3. Circulation

- 1961 - 1200 subscribers per issue, including 138 subscribers in 43 countries¹⁹
- 1982 - 2000 subscribers per issue, including subscribers in 84 countries.²⁰

4. Readership survey

In the fall of 1984, a JEL readership survey was conducted in order to obtain quantitative feedback on users' views about the Journal's current quality and about future topics and priorities germane to library and information science education. In his covering letter to subscribers, the editor noted that the major purposes of the Journal are "to report original research relating to education and to serve as a vehicle to keep the membership informed of Association activities".²¹

The Problem in Perspective

Objective description and appraisal of JEL's publication record is timely, for two reasons. The first reason is that some fifteen years have passed since Donald Lehnus published his 10-year analysis of the journal literature of library science education, for the period 1960-1970. Although the scope of his investigation was broader than JEL itself, this Journal was clearly his focus of interest. Even the title of his paper reflected it: "JEL, 1960-1970; An Analytical Study."²²

Of particular interest to Lehnus was whether there existed a core of highly cited authors and highly cited papers within the body of literature relating to education for librarianship. If so, one might be able to identify a research front and citation classics in the field. Moreover, he conjectured that it would then be possible to predict who the major contributors to the literature would be in the future.

Among the findings reported by Lehnus were the following:

- o Fifty-five percent of the JEL articles were unreferenced (130 out of 235 papers);
- o There was an average of eight references per article among the remaining 105 papers in JEL, and the range was from one to thirty-two;
- o Self-citation frequency among referenced JEL articles accounted for 5.5 percent of all citations (46 out of 838 total);
- o Fourteen percent of the citations in JEL articles were to the literature of education while an additional twenty-two percent of the citations were to works outside both library science and education;

- o Regardless of subject domain, 43 percent of all citations in JEL articles were to journals and 52 percent were to books, pamphlets, conferences, reports, and the like, while less than one percent were to doctoral dissertations;
- o Over half of the citations in JEL articles were five years or less in age at the time of their use (449 out of 838 total);
- o Ten authors were cited six or more times each in JEL articles and they were, in descending rank, Shores, Carnovsky, Shera, Berelson, Bonk, Reed, Danton, Wasserman, Williamson, and Lancour;
- o Only two works received as many as six citations in JEL articles: Training for Library Service by Williamson (1923), and Problems of Library School Administration edited by Reed (1965).

The early JEL profile sketched by Lehnus was a gloomy one: an unscholarly (and unrefereed) journal with a large proportion of unreferenced articles, no sharply discernible research front of contributing and cited authors, and no core literature of citation classics. He conjectured that:

If the paucity of documented articles in a given area indicates a lack of serious inquiry, then the evidence ... might indicate that there are few research articles appearing in this professional journal.²³

With respect to those articles in JEL which contained bibliographic citations, analysis revealed no strong citing preferences either for authors or for papers. Thus, the existence of a research front or of citation classics in library science education could not be claimed.

Moreover, he predicted that unless deficiencies were addressed soon, JEL would not be a major force in future educational inquiry. He wrote:

It is not the journal which is to blame, but rather we in the field who are not doing the necessary research and using JEL to transmit

it to our peers in the field of library [science] education.²⁴

The question arises, then: To what extent is the earlier Lehnus profile of JEL still valid? Some quantitative evidence of the current validity of this profile is desirable, in order that we can more adequately assess the recent record of JEL in transmitting the results of scholarly inquiry and so that we can more adequately characterize the state of current research in library and information science education.

Moreover, an appraisal of JEL's record of performance over the past quarter century is timely because AALS, its sponsoring body, has recast its formal identity. At the beginning of 1983, AALS became ALISE, the Association for Library and Information Science Education. In urging the membership of the Association to adopt the new name, the board of directors provided the following rationale:

[The] Association is predominantly made up of personal members, is international in scope, its objective includes information science, and ... the majority of members work in schools, the names of which include "information"²⁵

In addition, commencing with the anniversary issue of volume 25 in the summer of 1985, JEL becomes JELIS, the Journal of Education for Library and Information Science. In announcing the change in name, the Editor emphasized the dramatic impact of technological advances on all aspects of the information professions, and suggested that the new title would describe more adequately "who we are and what we are trying to do". Moreover, he noted that the new title also reflected the "necessarily expanded goals and objectives of the Association." He concluded by indicating that:

As the Journal moves toward its second quarter century, let us hope that, regardless of its name, it will continue to report and reflect that which is important to us in supporting and extending our efforts to educate those who choose to enter library and information service and the many and diversified information professions.²⁶

At the time of this writing, it is understandably a matter of mere speculation to suggest whether, how, and at what future point the titular change will become manifested in the substantive pages of the Journal.

Thus, again, in order to provide a point of comparison, there is a need for enhanced knowledge about JEL's record. Quantitative evidence of extant patterns is needed in order to help inform the perspective of educators, researchers, educational policymakers, and policymakers connected with the Journal and with ALISE.

In short, is it the case that the Journal has now become, as the editor recently wrote, "the preeminent journal in library and information science education in the world"?²⁷ And can it remain so, in the face of competition from the new journal which began publishing in March, 1983, Education for Information: The International Review of Education and Training in Library and Information Science edited by R.F. Guy and J.A. Large and published by Elsevier Science Publishers?²⁸

Theoretical Framework

This study describes and evaluates key bibliometric patterns in the articles published by JEL during its first twenty-four years of existence. The work, then, is a partial replication of the Lehnus study. In addition, it endeavors to "rigor up" the application of bibliometric concepts and to extend the scope of investigation. It is hoped that a more comprehensive characterization of JEL will thus be realized.

One objective of bibliometric research is to reveal how authors in a field or field subset organize and communicate their intellectual efforts. The efforts thus revealed can be those at a given point in time or those over a period of time. Of particular interest is the discovery of probable trends which can be inferred from large-scale shifts in bibliometric patterns.

Bibliometric patterns try to portray a certain kind of human behavior with respect to the flow of information. This is the behavior of scholarly authors and their many "gatekeepers" such as editors, referees, and publishers. Scholarly authors and their gatekeepers do more than assist in a flow of information. Ideally, only certain information is permitted to "flow"--information that is the product of rational inquiry--and this particular kind of information must pass through a variety of quality control processes, including the reaction at large of the community of scholarly consumers.

On the other hand, whatever the quality level of information flow, there is no direct way of empirically observing and measuring it. Only certain tangible proxies, certain cultural artifacts, exist which are manifestations of this flow. These artifacts are scholarly publications.

From these artifactual manifestations, it is possible to infer a variety of bibliometric characteristics of scholarly research and productivity. As Bazerman noted in a profoundly revealing comparison of the relations between knowledge and academic discourse in the three domains of science, social science, and the humanities, the focus in such textual research is structural but the consequences and import are functional. "From the shape of things, one can better understand how things happen".²⁹ Frohmann has noted in addition that: "Just as a command of geography aids navigation, a good representation of the structural characteristics of a discipline helps both researcher and scholar to identify issues and problems in the field".³⁰ Thus, bibliometric research aims at visualizing and describing the authors who create such structural patterns, with particular emphasis on their publication habits.

Thus, by investigating and describing the formal characteristics of JEL--bibliometric variables such as subject matter of articles, age of cited works, publication format of cited works, and research insularity versus internationality--the present study tries, at the same time, to characterize the primary authorship of the educational literature and to shed light on the essence of the field itself. In particular, citation patterns--the ways in which authors cite the work of their peers (and of others)--are a rich source of quantifiable data about publication phenomena. Accordingly, they are subjected to close analysis for what they are able to reveal about the citing authors themselves, and about their field at large.

Bibliometric research methodology is founded upon a number of theoretical propositions, some of which are of longstanding and continuing debate. Recent treatments are by Cronin, Line, Smith, Garfield, and Oromaner.³¹ These theoretical propositions concern: the relationship between a field and its literature, the relationship between intellectual competition and consensus,

and the relationship between scholarship and citation.

The first theoretical proposition is that the literature of a field, the archival record of cognitive effort expended by a community of authors, represents the field itself. That is to say, all the important problems and issues addressed by the intellectual community have been documented for peer review and have survived the field's formal systems of refereeing, editing, and publishing. This condition may not be satisfied in the short term, since a great deal of research effort that ends in blind alleys and in other unsuccessful strategems never gets written up for public consumption. Generally speaking, what authors report in the literature is success, not failure.

Another theoretical proposition forming the intellectual foundations of bibliometric research is that normal science is, simultaneously, both institutionalized competition and a highly cooperative and consensible activity. It is, as Ziman has phrased it, "the corporate product of a vast social institution."³² From this consensus-producing effort, certain implications may be derived with respect to the relationship between scholarship and the citing norms of scientists. Ziman observed that:

Scientific papers are derivative, and very largely unoriginal, because they lean heavily on previous research. The evidence for this is plain to see, in the long list of citations that must always be published with every new contribution. These citations not only vouch for the authority and relevance of the statements that they are called upon to support; they embed the whole work in a context of previous achievements and current aspirations. It is very rare to find a reputable paper that contains no references to other research. Indeed, one relies on the citations to show its place in the whole scientific structure just as one relies on a man's kinship affiliations to show his place in his tribe.³³

Thus, any investigation of bibliographic citation patterns rests on the proposition that cited works are more useful, more germane, to the collective knowledge base of a field than works not cited. The extent to which this

theoretical view is valid, however, is a matter of considerable conjecture--and, concomitantly, a matter of very limited empirical study. For instance, it has been claimed that authors do not actually read all that they cite, and of course it goes without saying that they do not cite all that they read. As well, Oromaner argued recently that citations may not indicate the most innovative and creative work. Moreover, recent research into the functioning of citations in papers suggests that up to one-half of them could be considered redundant, perfunctory, or ceremonial.³⁴

It has also been demonstrated that a researcher does not automatically select the best research papers for review and citation. The factor of document accessibility--in terms of form, place of origin, age, language, coverage by secondary services--may be of equal or greater importance than quality in an author's selection decisions.³⁵

In the absence of a satisfactory theory of citing, there is little understanding of the relationships which exist between citing and cited documents. At the heart of the problem, according to Cronin, is the unknown motivation of authors.³⁶ This involves a mysterious interplay of both sociological and psychological factors, particularly the relationship between an individual's personality, background, cognitive style, professional training and experience, belief system, and the professional milieu both in terms of the specific research at hand and the communication systems governing the dissemination of that research.

Cronin observed that:

Ultimately, citation is a private process (Chubin and Moitra, 1975) albeit a private process with a public face. The essential subjectivity of the act of citing means that the reasons why an author cites as he does must remain a matter for conjecture. What is lacking, in Swanson's (1977) view, is a rapid and convenient measure for discovering the relevance link which the citing author

has established. This conjectural element is worth pursuing, precisely because the end-product of the private process (the citation) acquires the status of a public commodity.³⁷

He concluded that:

We cannot say that citation is an activity governed by adherence to a specific and universally recognised set of norms. By the same token, the evidence does not permit us to conclude that the practice is characterised by randomness and inconsistency.³⁸

Thus, the nature of inter-document linkages is not amenable to objective scrutiny. The most satisfactory explanation may turn out to be, as Cronin and others have argued, that citation is an instance of tacit knowledge, a kind of craft skill acquired and exercised, largely without conscious reflection, through the educational and institutional processes of socialization or enculturation.³⁹

Citation analysis is a very general measure of the utility of the contribution made by an individual to cognitive progress in a field. Utility is thus not to be equated with importance or impact: a highly cited work is one that has been found useful by a relatively large number of publishing peers.⁴⁰

Other theoretical premises issue from the nature and quantification of citation phenomena. A fundamental one in terms of data collection and analysis is that each citation is of equal weight with a fixed value of one. By reverse inference, therefore, each citation would have been of equal utility and relevance to the citing author. Typically, citation studies have ignored factors such as the location of citations within a paper⁴¹ and multiple mention.⁴² As Cronin has pointed out, future studies of citations should concentrate on their context, their content, and on the conditions of their creation and application.⁴³

In spite of some degree of extant theoretical inadequacy, citation analysis reveals not only the structure of publication utility within a field, but it also reveals the career patterns of publications themselves: How many perish? How many survive, and for how long? What and who replaces them? Such questions are the driving force behind bibliometric analysis; and it appears that, at least for a time, theoretical advances are more likely to issue from the failures and frustrations of slightly blind empirical researchers than from theorists concentrating upon formal analysis. This may be attributable in large part to the relative simplicity of verificational procedures required to investigate the relevant research questions, because bibliometric research uses as units of analysis those cultural artifacts issuing from author and gatekeeper phenomena: source publications, their careers, and their citations. As such, these units of analysis permit the implementation of procedures that are entirely unobtrusive and non-reactive.

Review of Related Literature

Since the Lehnus study in 1971, a number of bibliometric investigations of library and information science have been reported in the literature. Several of these have focused on the nature of secondary information services while others have focused on the role of annual reviews and still others have investigated the characteristics of a particular form of literature, such as doctoral dissertations or periodicals. A recent group of bibliometric studies has tried to describe the parameters of the domain itself, or of subject subsets of the domain, typically through analysis of the relevant journal literature. Notable work has been reported on two subsets of the domain: 1) the literature of library administration, by Mittermeyer and Houser;⁴⁴ and, 2) the literature of cataloguing and classification, by Frohmann.⁴⁵ The methodology of the present work is modelled on their approaches. Also, the findings of the present work are compared briefly with their findings, as a way of giving some quantitative context to the JEL data analysis.

In addition to the types of bibliometric studies identified above, there are a number of single journal and multiple journal studies in the field that merit reference. These are the doctoral dissertations by Peritz⁴⁶ and by Cline.⁴⁷

Peritz attempted to describe the "research papers" published by twenty-four core library science journals during five time periods, 1950, 1960, 1965, 1970, and 1975. This work is flawed by two conceptual problems. The first is that the twenty-four journals which are claimed to constitute the core are selected through an arbitrary and idiosyncratic procedure for which no theoretical justification is presented by the author. The second--and much more serious--problem is that the concept of a "research paper" is neither

theoretically nor operationally defined by the author. De novo, the author formulates the following definition of the term "research": "any inquiry which is carried out, at least to some degree, by a systematic method with the purpose of eliciting some new facts, concepts or ideas"⁴⁸ (Peritz's emphasis). This definition--for which no prior source was given for the understandable reason that there was none--is not drawn from the primary literature of epistemology.

In another place, she asserts that it is a "well known fact that not all scholarly papers are research papers."⁴⁹ This statement is not explained. Nor is an adequate explanation given for excluding review articles from the study.⁵⁰ Moreover, several terms within the definition are left undefined, as though self-evident; however, the adequacy of the definition hinges on their explication. What is an "inquiry"? What is a "systematic method at least to some degree"? What is a "new" fact, concept, or idea? Without explication of all of these defining terms, the author's definition of research remains vague and thus inadequate as a basis for empirical research: How are we to know a "research" from a "non-research" paper when we see one? Necessary and sufficient conditions for using these terms are not given.

Moreover, the author violates even the definition which she formulated, in noting later in her work that research papers of two or less pages were excluded, because "for papers as short as this, it is very difficult to distinguish between reports of research, casual notes, marginalia, comments and pieces of scholarly polemic."⁵¹ Ironically, the two-page criterion is the only reliable (if not conceptually valid) operational indicator presented by the researcher.

Hence, it must be concluded that inter-subjective agreement and conceptual consensus in the community cannot be attained as a consequence. The study results may very well be as much an artifact of the author's classificatory decisions as of the journal articles themselves. This can be illustrated by the following instance. The author found that JEL, for the four years examined (1960, 1965, 1970, 1975), contained less than twenty percent research papers.⁵²

Nonetheless, even a very gross operational indicator of research activity must be that prior research is acknowledged by means of bibliographic citations. "Unreferenced research" (Peritz's phrase⁵³), that is, research that does not acknowledge antecedent work, is inconceivable, for no researcher has ever started de novo, at least certainly not in the twentieth century. "Unreferenced research" is a contradiction in terms--research always starts from what is already known. On this parameter, for the years of JEL examined by Peritz, sixty percent of the 89 articles published by the Journal contained bibliographic citations. This percentage is an objective and replicable figure. Peritz's twenty percent "research" figure for JEL articles is not.

Another fundamental weakness in the quest for a subset of "research papers" within the population of journal articles is that one could conjecture that all journal articles constituted research papers in the eyes of not only their authors but of the journal editors and other gatekeepers. That is to say, for most journals purporting to report scholarly communications, acceptance of a manuscript for publication automatically confers upon it the status of research paper--even if it is later judged by the broader community of informal opinion to be of poor quality, or without heuristic value. On this basis, it is the editors and their juries who decide what is to be counted, at least for that time, as research--not subsequent investigators

whose evaluative criteria are unstated and so not replicable. The conceptual flaws render findings and conclusions invalid.

Cline's work, a longitudinal citation analysis of College and Research Libraries and Special Libraries, is also conceptually flawed, but there is a methodological weakness that is of more immediate concern here: "All references listed as Ibid. or Op. Cit. were included."⁵⁴ This multiple counting of bibliographic references is contrary to the well-established convention in bibliometric research of counting each cited work only once in each citing work. "Ibid.'s" and "op. cit.'s" may possibly reveal how important a particular work was to the citing author, but such multiple counting results in an artificial inflation of citation frequencies, and hence renders data incompatible with the data from other bibliometric studies in which the conventional approach has been followed.

Although a number of comparative demographic studies of journal article authors have recently appeared, they have proven to be narrow in scope and of very limited theoretical interest. Somewhat more germane to the present study is a content analysis by Goldhor of a sample of twelve issues of Library Journal covering the years 1958 to 1980.⁵⁵ His objective was to categorize publication content into four types--advertisements, book reviews, articles, and text departments--and to describe salient quantitative features of each type; for example, number of pages devoted to each type. With respect to articles, additional bibliometric variables were studied: articles per issue; subject matter of articles; types of methodologies followed in articles; authorship collaboration; occupational status of article authors; unreferenced articles; and, citations per referenced article. Although Library Journal does not purport to be a vehicle of scholarly communication--indeed, perhaps because of this very condition--comparison with a scholarly journal would

accent their differences. In the absence of comparable data from other single journal studies, this comparison at least provides for the likelihood of large differences on a number of bibliometric variables; for example, the proportion of unreferenced to referenced articles, and citations per referenced article. These data will be noted later, in the section on findings.

Findings from two other journal studies will also be treated later. These are: Meadows' and Zaborowski's very brief profile of the Journal of the American Society for Information Science (JASIS),⁵⁶ and a brief summary translated by Wellisch of a comparative citation analysis of JASIS and Nachrichten fur Dokumentation, undertaken as a master's thesis by Eisenhardt.⁵⁷

Conceptual Problems and Definitions

Of course, the most important study for the present work is Lehnus' bibliometric analysis of JEL. Although some of the Lehnus data for the decade 1960 to 1970 can be used to compare with the data collected here for the later years, he did not address the following variables of interest in the present work: the proportion of pages devoted to articles versus news reports; the subjects treated in JEL articles; authorship collaboration; the demographic parameters of contributing authors; citation frequency per article and per article page; and cited authorship collaboration.

Moreover, some of the data could not be used because of conceptual difficulties. The most important issues from the need for a more rigorous definition of the notion of a journal "article".

1. Article

Lehnus defined an "article" as:

any contribution that was not a regular feature item of the journal. News notices of meetings, new accreditations, faculty appointments, etc., were not considered as articles. In the case of JEL all the news items of the activities of the AALS, as well as its annual directory of library educators were not considered as articles. In the composite articles where the writing of each individual is separable and distinguishable each was counted as a separate articles; but an article written jointly without such distinction was considered as a single article.⁵⁸

Although data collection was commenced on the basis of the Lehnus approach, its inadequacy for operational decisions was almost immediately evident. Neither the bibliometric literature nor professional glossaries were helpful in clarifying the matter. The 1984 edition of Harrod's Glossary gives the following definition of "article":

A contribution written by one or more persons for publication in a PERIODICAL (q.v.); such a contribution when so published. See also WORK.⁵

The definition of "work" is:

Any expression of thought in language, signs or symbols, or other media for record and communication [i.e. a work before printing or other publication]. After publication it becomes a "published work". See also DOCUMENT. A work is now generally taken to mean a published DOCUMENT (q.v.) varying in extent from a single paper (see PAPER 2) or ARTICLE (q.v.) to a contribution to knowledge written by one or more persons and published in several volumes, or even all the published writings by one person. It is also used to include a series of related but separate series (see SERIES 1,2,2) or PERIODICALS (q.v.)⁶.

The 1983 Glossary of the American Library Association defines "article" as:

A work of prose, identified by its own title or heading and frequently by its author, in a document that contains many such works, e.g., an article in a periodical or encyclopedia.⁶¹

The 1973 edition of Elsevier's Dictionary defines "article" as:

A literary composition in a journal or magazine, etcetera.⁶²

The 1966 Oxford English Dictionary gives the following definition of "article" :

A literary composition forming materially part of a journal, magazine, encyclopaedia, or other collection, but treating a specific topic distinctly and independently. (Here the idea of a section or part of the book, is quite subordinated to that of the independent character of the 'article.' It is one of the articles in the paper, as distinguished from the articles of this Dictionary.)⁶³ (emphasis in original)

The inadequacy of Lehnus' definition of "article" was particularly evident for the early years of the Journal, when, as already pointed out, news reports of various issues and activities and news summaries of meetings, committees, panel discussions, discussion groups, symposia, conferences, and the like appeared intermixed with articles. Also intermixed with articles in the early years were reports of current statistical data on library school enrollment and reports of related professional associations and committees.

Finally, items such as "Teaching and Practice of Reference Service"⁴ were also intermixed with articles in the early years.

Lehnus classified as articles some items which were news reports on various matters or journalistic summaries of meetings, symposia, conferences, and the like. These reports and summaries were not papers prepared and read at the events but rather were second-hand accounts. This categorization tended to inflate the JEL article count.

In the present study, items of this kind were excluded from the category of "articles". Titles of all excluded items are listed in Appendix I. In order to render classification decisions more credible, all items whose status as articles or news reports was not readily apparent were judged, independently of each other, by two colleagues. Items so referred totalled 23. Of these items, both referees agreed to exclude all but four. (The authors excluded them also.)

The effect of this more rigorous conceptualization of JEL articles is to reduce their number from Lehnus' population for the 1960-1970 period of 235 to 219 in the present work. Such a difference has important implications for bibliometric variables; for example, proportion of total pages devoted to articles, overall article scholarliness, frequency of citations per article, and contributing author demographics.

2. Article Subject

The subject or subjects treated by JEL articles were assigned from the official cumulative subject indexes produced by Charles D. Patterson, current Editor of the Journal.⁵ These indexes cover the period 1960 to 1980 only, volumes 1 to 20; consequently, no subject heading assignments were made for the subsequent years, volumes 21 to 24 inclusive. Excluded from the analysis of subject coverage were all index terms relating to the affairs of AALS and other associations, to regular features of the Journal, and to news reports carried by the Journal.

3. Bibliographic Citation

The terms "citation" and "reference" as used to denote bibliographic items in an article note or footnote are synonymous. They were interpreted following Lehnus' criteria as closely as possible:

Any reference to an article, book, letter, personal notes and interviews, etc., was considered as a citation. Several references to the same item in one article were considered as a single citation. Works to which the reader was referred for further information were also considered as citations. Excluded were all items intended as a bibliography per se, and not as a list of items of notes or references for the article.⁶

If an author included a section of "additional references", these were included as citations in the present study, but a "bibliography" or a list of examples was excluded. Standard sources, such as the ALA Glossary of Library and Information Science, Harrod's Librarians' Glossary, Elsevier's Dictionary of Library Science, Information and Documentation, as well as Webster's Third International Dictionary and the Oxford English Dictionary, were searched to ensure that decisions as to what constituted a citation were in keeping with the spirit of accepted usage. In ambiguous cases, independent judgments were made by two researchers and consensus was established.

The 1984 edition of Harrod's Glossary gives the following definition of "citation":

A reference to a text or part of a text identifying the document in which it may be found. See also REFERENCES: A list of publications to which an author has made specific reference; usually placed at the end of an article or chapter, or at the end of a book, sometimes in chapter order. The entries are usually arranged in number order, corresponding numbers appearing in the text. Also called "Citations".⁶⁷

The 1983 ALA Glossary defines "citation" as:

A note referring to a work from which a passage is quoted or to some source as authority for a statement or proposition.⁶⁸

Cline followed Price's usage of the terms "reference" and "citation" in her dissertation:

It seems to me a great pity to waste a good technical term by using the words citation and reference interchangeably. I, therefore, propose and adopt the convention that if Paper R contains a bibliographic footnote using and describing Paper C, then R contains a reference to C, and C has a citation from R. The number of references a paper has is measured by the number of items in its bibliography as endnotes and footnotes, etc., while the number of citations a paper has is found by looking it up in some sort of citation index and seeing how many other papers mention it.⁶⁹

Bertram, in her 1970 dissertation concerning citation analysis, defined "citation" and related terms as:

Citation: the indication given in the document (usually by means of a superscript or the last name of the author plus the date of publication) which leads to the specific footnote which should be consulted for further information. Citation is also used as the more inclusive term indicating the whole sequence involved in the referring by one document to another document.

Footnote: the physical entity, the group of words located at the bottom of the page or in a list at the end of the document.

Reference: the bibliographic or non-bibliographic information contained in the footnote. (Text is defined in a similar manner to mean the information contained in the document, while the document is the physical item.)

Bibliographic citation: the bibliographic information (in this case given in the footnote) which leads to the specific document which is to be consulted for further information.⁷⁰

The 1973 edition of Elsevier's Dictionary defines "citation" as: "a reference", "to cite" as: "to quote a passage, book, or author", and a "reference" as: "an indication of where to find specific information, e.g. a document, author, etc."⁷¹

The 1973 Oxford English Dictionary gives the following definition of "citation":

The action of citing or quoting any words or written passage, quotation;

and "to cite" as: To quote (a passage, book, or author); gen. with implication of adducing as an authority.⁷²

Anselmo in her dissertation used the following:

Citation: a footnote or a bibliographic reference to any published work

Citer: a person who, in a bibliographic reference or in a footnote, refers to any published work.⁷³

In the present study, if the article text contained a bibliography but no bibliographic reference in the "Notes" or "Reference" section at the end of the article, such a bibliography was excluded. The following were articles in JEL found to have embedded bibliographies:

Vol. 6:1, p. 27
Vol. 7:4, p.210
Vol. 9:2, p. 95
Vol.10:1, p. 3.

Also, in the case of anthologies whose contents were cited several times, Lehnus counted as a citation not only the cited author but the anthology editor as well.⁷⁴ While editorships are of interest here, as well, the effect of such double counting was to inflate the citation frequencies of authors-cum-editors. On the other hand, Lehnus' Table 6 of "authors who were cited at least three times" appears to contradict the stated approach; Reed, for example, received three citations according to this table, but according to Table 8 she received six citations as an editor.⁷⁵

Moreover, Lehnus' Table 6 of "authors who were cited at least three times" is misleading because he excluded individuals who had only one title cited, even though such a title might have been cited by many different authors. Lehnus does not indicate how many authors went unreported as a consequence. This is enigmatic if the research objective is to identify highly cited authors and highly cited titles.⁷⁶

4. Scholarliness

Windsor and Windsor conducted a study of information scientists and the citing of their own publications. Their study proposed as a measure of the scholarly status of a field "the ratio of papers without references to those with references."⁷⁷ One criterion for regarding publications as "scholarly" is coherence in relation to past knowledge. Therefore, one indicator of scholarliness should be the presence of formal acknowledgements of that foundational knowledge and its creators, through bibliographic citations. The concept of scholarliness can thus be given a partially measurable form in the phenomenon of bibliographic citations. However, this theoretical framework does not provide for how much knowledge must be formally acknowledged, so that more citations do not automatically or necessarily imply a greater degree of scholarliness. Footnote quantity is not an indicator of research quality.

5. Publication Format

Another conceptual difficulty which makes previous data unusable relates to Lehnus' classification of publication formats,⁷⁸ with particular reference to his overly broad format of "books, pamphlets, conferences, and reports" as a single category. In addition, the level of precision reported in the Lehnus

data does not permit longitudinal comparison among variables, and so multifaceted shifts in bibliometric patterns cannot be identified. For example, the age distribution of cited works is grouped into five-year intervals and so a more detailed analysis of patterns of most recent citations is not possible. Also, no overall frequency distribution of citations by author is presented in tabular form; only grouped data are mentioned in the text.

There is a need for more clarity in the glossaries which attempt to standardize concepts in library and information science, as these do not always discriminate between publication form or format, and publication function.

The ALA Glossary defines "format" as: "in its widest sense any particular physical representation of a document",⁷⁹ and "document" as:

A physical entity of any substance on which is recorded all or part of a work or multiple works. Documents include books and booklike materials, printed sheets, graphics, manuscripts, audiorecordings, videorecordings, motion pictures, and machine-readable data files.⁸⁰

This glossary further defines "publication" as: "a published document", as well as:

the act or process of distributing copies of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending. The offering to distribute copies to a group of persons for purposes of further distribution, public performance, or public display also constitutes publication.⁸¹

To "publish" is: "to have a document manufactured and made available to the public," while published is "said of a document that has been made available to the public".⁸²

Harrod's Glossary treats publication format similarly, defining "format" as:

A term used to describe the appearance and make-up of a book; its size, shape, paper, type, binding, illustrations, etc.

and a "publication" as:

A work issued to the public in the form of a document or book; [or] the act of issuing a book to the public;

while "published" is said to be:

A document which has been reproduced in a number of copies and made available to the public to whom it may be sold or distributed free of charge and whether or not it is intended to have a restricted readership such as to members of parliament, of a learned, professional, or political organization.⁸³

Based on the existing definitions, then, "publication format" in the present study refers to the physical identity of a recorded work and implies the dissemination or transfer of intellectual content, so as to satisfy conditions of the publication process. However, it should be noted that references to unpublished documents are also included.

There is no consensus in previous citation analyses on a standard typology of publication formats. Some studies use a very simple set of types, such as: journal, monograph, and other. Yet other studies, such as Cline's,⁸⁴ use a somewhat more elaborate typology.

In his analysis of JEL citations, Lehnus created five major categories for type of publication format:

- periodicals;
- books, pamphlets, conferences, reports, etc.;
- letters, speeches, interviews, etc.;
- Ph.D. theses; and,
- Master's theses.⁸⁵

However, neither Lehnus nor others have produced a set of format categories suitable to capture the variety of publication formats cited in JEL articles. The typology which was developed for the present study included 17

categories, and is listed in Appendix II. Whereas Lehnus termed his first category "periodicals," the current JEL investigation treated journals, newsletters, and annual reviews separately. Similarly, whereas Lehnus combined books with pamphlets, conference proceedings, conference news, reports, plus an "etcetera" category--which requires guess-work to replicate--monographs in the present study were classed separately from technical or statistical reports, from conference proceedings, and from edited collections and anthologies. Pamphlets were placed in a miscellaneous class along with speeches, manuscripts, committee records and other materials.

For journal format, the ALA Glossary refers to a "journal" as:

A periodical, especially one containing scholarly articles and/or disseminating current information on research and development in a particular subject field;⁸⁶

while a newsletter is distinguished as:

A serial consisting of one or a few printed sheets containing news or information of interest chiefly to a specific group.⁸⁷

In cases where categorization was not readily apparent from the title proper, this aspect of national audience versus regional or local interest group formed a distinguishing criterion for inclusion in the newsletter class (regional or local scope) and exclusion as a journal source (national or major, wider group appeal). Annual reports were considered separately from these types of serials.

Technical reports were those "giving details and results of a specific investigation or a scientific or technical problem"⁸⁸ and included the disciplines of library and information science, the social sciences, and education as well as the natural or pure sciences.

The clearest definition of an edited collection occurs in the 1977

edition of Harrod's Glossary:

A work consisting of separate items, often written by different people, which has been assembled or prepared for publication by an Editor.''

Finally, Harrod's defined a "monograph" as: "a systematic and complete treatise on a particular subject."'' Library tools such as handbooks, guidebooks, or other reference works were treated as a category separate from monographs, in the present study, to distinguish their use as sources.''

Data Collection Methods and Procedures

Line has suggested that a standard code of practice should be followed for the conduct of bibliometric studies, and his specified criteria¹² were applied during the present study of JEL.

Using computerized files, two databases were built for volumes 1 to 24 of JEL. The first database consisted of source article information. The definitional criteria for source articles were applied and, as previously mentioned, the collaboration of professional colleagues was secured in ambiguous cases (see Appendix I). All qualifying source articles were numbered in consecutive order (n=473).

The database of source article information included volume and issue numbers, authorship and author occupation codes, geographic location of contributing author, gender of contributing author, source article subject codes, article pagination, and presence or absence of citations.

Data from each issue of JEL were then analyzed using SPSSx for nine characteristics of the population of published articles: number, length, subject matter, scholarliness, authorship collaboration, occupational status of authors, geographical distribution of authors, gender of authors, and, productivity of authors.

The second database consisted of information about the bibliographic citations contained in JEL source articles. The references cited within each article were consecutively numbered throughout all volumes (n=3655). These citation codes were recorded manually in the journal issues and were input directly into the database from the coded issues. For source articles with no citations, the numeric citation sequence was simply carried forward from the

last-numbered citation. Codes were also input for journal volume, issue date, publication date of the cited work, authorship and/or editorship, type of publication format, and journal title where applicable.

Data were then analyzed using SPSSx for seven characteristics of the population of bibliographic citations in JEL articles: frequency, age, publication format, journal titles, authorship collaboration, productivity of cited authors, and the titles of most frequently cited publications.

1

Findings

JEL published a total of 473 articles between 1960 and 1984, about 5 works per issue. These articles were written by 424 different authors (366 different first authors and 58 different second authors). The typical article in the 1960s was 7 pages long, but by the 1980s it had doubled in length. The overall proportion of pages in each issue devoted to articles, however, remained relatively constant, at approximately 70 to 75 percent. (See Appendix IV, Tables 1-6.)

Subjects most frequently addressed in JEL during the period of time for which subject indexes are available (1960 to 1980 only) were international and comparative library education, curriculum, and library education. When subjects are ranked by the number of times mentioned in the indexes, the following pattern emerges:

1. international and comparative library education
(including status reports on individual countries)
2. curriculum - reference services
3. - design and development
4. - core courses
5. - cataloguing and classification
6. - special librarianship
7. - book selection
8. - aims and objectives
9. library education - aims and objectives
10. - philosophy.

It should be noted that the present descriptive study cannot account for purposive editorial decisions with respect to the subject matter of articles published in JEL. That is to say, do the data reflect the interests of the field, or a lack of papers treating other subjects? Moreover, it should also be noted that the present study cannot account for purposive subject indexing decisions. That is to say, do the data reflect indexer behavior, or the Journal itself? (Each of the 181 subject headings was used about 4 times.

See Appendix IV, Table 7.)

In spite of these perceptual difficulties, it can be stated that there were more mentions of international and comparative library education than of any other subject matter. There was also considerable attention to curriculum and related matters. There was not, however, very much attention to the philosophical aspects of library science education. In the absence of a strong consensus on the philosophical foundations of the field, this paucity of treatment in JEL articles must be regarded as surprising. One would expect the single most important problem for educators to be the nature of underlying philosophy for the education of neophytes. Where is the debate on the kind of discipline which we want--humanistic, managerial, social scientific, technocratic, and so forth?

Since JEL became a refereed journal beginning with volume 12 in 1971, its scholarliness has increased dramatically--at least insofar as a quantitative indicator reveals. Before 1971, just over half of all articles were referenced. Afterwards, this proportion grew steadily. Indeed, in the most recent three volumes, 9 out of 10 articles were referenced.

In a recent master's thesis, noted above, which compared the citations in a random sample of articles for the period 1966-1975 in two journals, Journal of the American Society for Information Science (JASIS) and Nachrichten fur Dokumentation (NFD), Eisenhardt found that 90 percent of JASIS articles were referenced but only 55 percent of NFD articles.³ On the other hand, in their analysis of citation frequency of articles indexed in volumes 1 to 6 (1966-1971) of Information Science Abstracts, Windsor and Windsor found that 30 percent of the articles contained no citations.⁴ Somewhat similarly, in an analysis of the literature of library administration indexed in Library

Literature between 1961 and 1970, Mittermeyer and Houser found that only 17 percent of the articles were referenced.⁵ Also, in an analysis of the literature of cataloguing and classification for the period 1969 to 1980, Frohmann found that 38 percent of the articles were referenced.⁶

A chi square test was used to verify the hypothesis that refereeing constituted a significant factor in the scholarliness of the Journal. The null hypothesis was disconfirmed (significance= .000). The table below shows the patterns in scholarliness of articles, before and after the adoption of expert refereeing of manuscripts. (Also see Appendix IV, Table 8.)

Table 1. Scholarliness of Articles in JEL, by Refereeing Policy

| | Articles with <u>citations</u> | Articles without <u>citations</u> | <u>Total</u> |
|----------------------------------|--------------------------------------|---|--------------|
| Before refereeing (1960-1970) | 122 (53.0%) | 108 (47.0%) | 230 |
| After refereeing (1970-1983) | 195 (80.2%) | 48 (19.8%) | 243 |
| Totals | 317 (67.0%) | 156 (33.0%) | 473 |

$X^2 = 54.801, df=1, sig. = .000$

Another important, though less dramatic, change since JEL became a refereed journal has been an increase in the frequency of authorship collaboration. During the Journal's first 10 years, the notion of joint authorship of an article was virtually unheard of. By the early 1980s, one out of three articles was authored by two or more individuals. Eisenhardt

found that 63 percent of JASIS articles were single-authored and 83 percent of NFD articles.' In most fields of the natural and human sciences, collaboration is taken to be a sign of development and maturity--though one must hasten to add that such collaboration is only a crude indicator of cognitive progress. (See Appendix IV, Table 9.)

The following table shows the occupational status of first authors of JEL articles for the period under study.

Table 2. Occupational Status of First Authors of JEL Articles, 1960-1983

| Occupational status | Articles | |
|---------------------|---------------|----------------|
| | <u>Number</u> | <u>Percent</u> |
| Educators | 340 | 71.9% |
| Practitioners | 100 | 21.1% |
| Students--doctoral | 15 | 3.2 |
| --master's | 12 | 2.5 |
| Unidentified | 6 | 1.3 |
| Total | 473 | 100.0% |

This table shows that 7 out of 10 first authors were educators. The presence of such a considerable proportion of practitioners raises the interesting question of whether or not the educators are intellectual masters in their own domain. (Also see Appendix IV, Tables 10 and 11.)

An analysis of the geographic distribution of first authors of JEL articles reveals that 90 percent were American and an additional 5 percent were Canadian or British. The remainder were located in 14 other countries. (See Appendix IV, Tables 12-15.)

By gender, two-thirds of first authors were male and one-third were female. (See Appendix IV, Tables 16 and 17.)

Of the 366 first authors published by JEL, over 80 percent of them contributed only one article during the 24-year period under study. Less than 1 percent of all first authors contributed 4 or more articles during this time. These authors were: Bidlack, Galvin, Grotzinger, Schick, Shera, Slavens, and Elizabeth Stone. (Bibliographic data are detailed in Appendix III. Also see Appendix IV, Tables 18 and 19.)

The 473 articles published in JEL during the period under study contained a total of 3,655 bibliographic references. Actually, since one-third of the articles lacked any references at all, as Table 1 above indicates, these 3,655 items were contained in 317 articles. As the average length of an article increased, so did the average number of citations. If both referenced and unreferenced articles are included, the average per paper before refereeing was 4 and afterwards 11. (See Appendix IV, Tables 5 and 6.)

Interestingly, citations in the referenced papers provide another indicator of increasing scholarliness of the Journal, because the average per article before refereeing was 8 and afterwards the average rose to 14; by the 1980s it was 17 citations per article. In the literature of library administration, Mittermeyer and Houser found that there were about 8 citations per referenced article.⁹⁸ Similarly, Frohmann found about 9 citations per referenced article in the literature of cataloguing and classification.⁹⁹

This evolving scholarship, however, is somewhat uneven. The range of citations per article goes from 0 to 66. The median falls in the group of 1-4 citations per article. Thus, just over 50 percent of all papers in JEL yielded 0-4 citations each. At the other extreme, a total of 37 papers were

heavily footnoted, producing 25-66 citations each. This skewing accounts for the high overall average citations per article. (See Appendix V, Tables 1-4.)

JEL scholarliness as evidenced by citations depended on recent publications. Almost half of all 3,655 citations were to works less than 5 years old, and over 70 percent to works less than 10 years old. Only 10 percent of all citations were to works older than 20 years. This suggests that JEL authors relied heavily on current materials in the production of their manuscripts. (See Appendix V, Tables 5 and 6.) Frohmann found that the overall median age of cited works in the literature of cataloguing and classification was 4 years.¹⁰⁰ Eisenhardt reported a similar figure for JASIS.¹⁰⁰

The relative recency of citations is in all likelihood accounted for by the heavy reliance of JEL authors on journals for their bibliographic references. Cited works in journals accounted for 40 percent of all citations, while cited monographs accounted for only 25 percent of the citations. The heavy dependence of authors on the journal literature is another indicator of the scholarliness of JEL, since journals are much more frequently subject to some form of refereeing than are monographs and conference proceedings, which generally have less consistent quality control. Similarly, Eisenhardt found that 47 percent of the works cited in JASIS were to journals and 27 percent to monographs.¹⁰² Mittermeyer and Houser reported 40 percent to journals and 43 percent to monographs, in the literature of library administration.¹⁰³ Frohmann reported 44 percent to journals and 23 percent to monographs, in the literature of cataloguing and classification.¹⁰⁴

Recency exhibited in the works cited in JEL articles is attributable primarily to the journal literature, because 50 percent of journal citations were 4 years or less in age, while the corresponding proportion of cited monographs was 34 percent. (See Appendix V, Tables 7 and 8.)

Up to this point, the data analysis has shown a journal becoming more scholarly on a number of bibliometric dimensions. The strongest evidence for this is the high proportion of citations to journals and the nearly 50 percent of all citations which were 4 years or less in age.

The next question is which journals made up this contribution. All the journals which yielded 15 or more citations were in the domain of library science if one includes information science (Journal of the American Society for Information Science and its predecessor American Documentation) and archives (American Archivist). The table below indicates the distribution of citations to highly cited journal titles.

Table 3. Most Cited Journals in JEL Articles

| <u>Journal title</u> | <u>Citations</u> | <u>Scholarly Status</u> |
|--|------------------|-------------------------|
| Journal of Education for Librarianship | 285 | yes |
| Library Journal | 120 | no |
| American Libraries/ALA Bulletin | 67 | no |
| College and Research Libraries | 58 | yes |
| Library Quarterly | 56 | yes |
| Library Trends | 42 | yes |
| Special Libraries | 38 | part |
| Journal of the American Society for Information Science/American Documentation | 36 | yes |
| American Archivist | 28 | ? |
| Libri | 27 | yes |
| Reference Quarterly | 27 | part |
| Unesco Bulletin for Libraries | 23 | yes |
| Medical Library Association Bulletin | 21 | yes |
| Wilson Library Bulletin | 21 | no |
| Library Resources and Technical Services/Journal of Cataloguing and Classification | 18 | part |
| Illinois Libraries | 16 | no |
| Library Association Record | 15 | no |
| Sub-total | 898 | |
| 282 other journals | 580 | |
| Total | 1,478 | |

These 17 journal titles yielded almost 900 citations over the period under study. That is to say, 6 percent of the journals received 60 percent of all citations to journals. This is equivalent to an overall median of at least one citation received each year by these most cited titles. At the other extreme, almost 60 percent of the journals received only one citation each during the entire study period. In general terms, the pattern in these journal citation data is that a few journals received many citations while many journals received only a few citations. (See Appendix V, Tables 17 and 18 for a Bradford distribution analysis.)

JEL itself is cited more than twice as often as the next ranking journal,

Library Journal. This attention to JEL is a positive indicator that contributing authors find it relevant to their own scholarship in the field of library science education. On the other hand, Library Journal and at least several more of the most cited journals are preponderantly vehicles for current awareness rather than for research. (In a content analysis of a random sample of articles in 12 issues of Library Journal from 1958 to 1980, Goldhor found that 17 percent of all pages were devoted to articles, and only 12 percent of them were referenced.¹⁰⁵)

Such heavy reliance in JEL articles on news publications raises important questions about the qualitative nature of that scholarship. A similar concern was raised by Mittermeyer and Houser, who found Library Journal was the most highly cited journal title in the literature of library administration.¹⁰⁶

It is reasonable to expect that researchers in library science education would look to the research literature of education for pedagogic theories, philosophies, principles, and practices. The data reveal that JEL authors cited 22 education journals about 4 times each over the entire period of time under study. While this is not a large proportion of the citations to the journal literature, no other fields provided more than 1 or 2 journals for citing except psychology with 11 titles which received 37 citations. (Also see Appendix V, Tables 9-11.)

What is true of the pattern of cited journals is also true of the pattern of cited authors: a few individuals received many citations, while many individuals received only a few. A total of 16 authors (less than 1 percent) received 9 percent of all citations. The range of citations for these most cited authors was 10 to 72 times during the study period. This is slightly

less than 1 citation per year over the 24 years for each of these authors. At the other extreme, about 70 percent of all 1,950 authors received only one citation during the entire period. (See Appendix V, Tables 12-14.) In Mittermeyer and Houser's study of the literature of library administration, 76 percent of all authors were cited once.¹⁰⁷ Frohmann's figure for the literature of cataloguing and classification was similar, 73 percent.¹⁰⁸

The most cited authors in JEL articles were the following:

Table 4. Most Cited First Authors in JEL Articles

| <u>Cited author</u> | <u>Citations</u> |
|---|------------------|
| American Library Association (and its divisions) | 72 |
| Shera | 33 |
| Association of American Library Schools | 26 |
| Williamson | 25 |
| Asheim | 22 |
| International Federation of Library Associations | 19 |
| Shores | 19 |
| Galvin | 18 |
| Danton | 15 |
| Carnovsky | 13 |
| Grotzinger | 13 |
| Wasserman | 13 |
| Bonk | 12 |
| Slavens | 11 |
| Lancour | 10 |
| Reece | 10 |

Corporate authorship was shown to play a large role in the literatures both of library administration and of cataloguing and classification.¹⁰⁹ Similarly, in JEL, 3 of the 6 most cited authors were professional associations, and the top ranked author was a corporate one, the American

Library Association. With 72 citations over the study period, the Association far surpassed the most cited personal author (Shera) who, with 33 citations, averaged just slightly more than 1 citation per year. (Also see Appendix V, Tables 15 and 16.)

However, the citation prominence of the American Library Association does not issue from any one publication. Although two of its titles were cited at least 5 times during the study period (Library Education and Manpower and Standards for Accreditation, 1972), other citations were distributed throughout a large number of published works.

This was not the case for the two most cited personal authors. Their citation prominence is attributable to a single publication each: Williamson's Training for Library Service in 1923, and Shera's The Foundations of Education for Librarianship in 1972.

Although the overall proportion of citations to journals was higher than the proportion to monographs (40 percent and 25 percent respectively), monographs accounted for the majority of highly cited titles in JEL articles examined here. A total of 12 monographs and 2 pamphlets received 5 or more citations each during the study period. Only 5 journal articles received as many citations. Three of these articles were published in JEL itself.

Table 5 shows the 18 titles which were cited 5 or more times in JEL articles between 1960 and 1984. The range of citations was 17 (5 to 21) for these most cited titles.

Table 5. Most Cited Titles in JEL Articles

| <u>Cited title</u> | <u>Author or editor</u> | <u>Pub'n date</u> | <u>Publisher</u> | <u>Number of citations</u> |
|---|-------------------------|-------------------|-------------------|----------------------------|
| Training for Library Service | Williamson | 1923 | monograph | 21* |
| The Foundations of Education for Librarianship | Shera | 1972 | monograph | 16 |
| Education for Librarianship | Berelson | 1949 | monograph | 14 |
| "Education and Manpower for Librarianship"; Library Education and Manpower | Asheim; ALA | 1968; 1970 | ALAB; pamphlet | 11** |
| Library Education: An International Survey | Bone | 1968 | monograph | 8 |
| The Administrative Aspects of Education for Librarianship: A Symposium | Cassata & Totten | 1975 | monograph | 7 |
| "The Status of 'Practicum' in Graduate Library Schools" | Grotzinger | 1971 | JEL | 7 |
| The Curriculum of Library Schools | Reece | 1936 | monograph | 7 |
| Training for Librarianship before 1923 | Vann | 1961 | monograph | 7 |
| "Doctoral Study in Librarianship in The United States" | Danton | 1959 | CRL | 6 |
| Education for Librarianship | Goldhor | 1971 | monograph | 6 |
| The Program of Instruction in Library Schools | Metcalfe & Russell | 1943 | monograph | 6 |
| "The Future of Library Education: 1975 Delphi Study" | Vance & Magrill | 1977 | JEL | 6 |
| Standards for Accreditation, 1972 | ALA | 1972 | pamphlet | 5 |
| The Professionalization of Education for Librarianship: with special reference to the years 1940-1960 | Carroll | 1970 | monograph | 5 |
| Handbook of Research on Teaching | Gage | 1963 | monograph | 5 |
| "The Case Technique in Education for Reference Service" | Galvin | 1963 | JEL | 5 |
| The Search for a Scientific Profession: Library Science Education in the U.S. and Canada | Houser & Schrader | 1978 | monograph | 5 |

* includes Vann's re-issue in 1971 of Williamson's work for the Carnegie Corporation under the title The Williamson Reports of 1921 and 1923.

** combines the two versions of this policy statement, Asheim's 1968 draft and ALA's 1970 official release.

Summary and Conclusions

A bibliometric profile of JEL during the period from 1960 to 1984 can be sketched as follows:

- o subject emphasis was on international and comparative library education, and curriculum concerns
- o 2 out of 3 articles had bibliographic citations, with this proportion growing rapidly in the early 1980s
- o 1 out of 3 articles was authored by 2 or more individuals in the early 1980s
- o 7 out of 10 first authors were educators, 9 out of 10 were Americans, 2 out of 3 were male
- o less than 1 percent of all 366 first authors contributed 4 or more articles to JEL
- o 317 articles contained 3,655 citations, on average 8 before JEL became a refereed journal, 14 afterwards, and 17 in the 1980s
- o range of citations per articles was 0 to 66, with a median of 1-4
- o half of all citations were to works less than 5 years old
- o cited works in journals accounted for 40 percent of all citations, monographs for 25 percent
- o 6 percent of all cited journals received 60 percent of all citations to journals, with JEL receiving twice as many citations as the next ranked journal
- o less than 1 percent of all 1,950 cited authors received 9 percent of all citations, while 70 percent received only 1 citation over the entire study period
- o the most cited author was corporate, receiving twice as many citations as the next ranked author, a personal one.

This analysis indicates increasingly rigorous scholarship among library science educators and authors. This is indicated by the increasing frequency and number of bibliographic citations, the increasing length of papers, and collaborative authorship. These are healthy signs for any domain. Similarly, the heavy reliance on journals is an additional positive sign of good scholarship, in that the importance of recent materials is recognized. These indicators provide an insight into the essence of the field: an attempt is being made to enhance intellectual credibility and scholarly status. JEL has evolved from a news journal in the 1960s to a vehicle for scholarly communication in the 1980s.

However, the goal of any field is intellectual consensus, and none of the indices developed in this study point to the existence of such a consensus. There is, on the conceptual level, little interest in the philosophical foundations of library science education. There is no well-defined core of domain problems. Concomitantly, there is no well-developed core of either contributing authors, cited authors, or cited works over the 24-year period examined in this study. Beyond these quantitative estimators, bibliometric analysis must be coupled with critical review of the substantive content of JEL articles, in order to shed further light on the domain thereby represented. This light is all the more important if the policy of JEL is to continue to claim that it is the preeminent journal in library and information science education in the world, the principle channel of scholarly communication among educators in--at least--the English-speaking international community.

This research was funded in part by grants from the Association for Library and Information Science Education, from the Faculty of Library Science at the University of Alberta, and from the Small Faculties Endowment Fund--Support for the Advancement of Scholarship at the University of Alberta. (Appendix VI estimates total project costs.)

This research is also indebted to Dr. A. Altmann, formerly on the Faculty of Library Science, University of Alberta, S. Flood and C. Hall, formerly MLS students at the University of Alberta, and Dr. L. Houser, Faculty of Library and Information Science, University of Toronto.

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17:unnumbered verso of Table of Contents page, Spring 1977.
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APPENDIX I

ITEMS IN JEL EXCLUDED FROM THE DATABASE OF JOURNAL ARTICLES

A. Items Excluded by the Author

Regular Features:

- Association Activities
- Calendar of Events
- Contributors to [the] Issue
- Editorials: Forum, Notes, Foreword,
 plus commentary or introductory remarks
- Of Special Interest
- Miscellany
- Reviews
- Research Reports

A.A.L.S. Constitution and By-Laws

Accredited Library School Enrollment Statistics

A.L.A. Committee on Accreditation Annual Report

Directory of the Association of Library Schools

B. Items Excluded by Both Referees

- 1(1):22 "Equating Professional Library Qualifications"
 -- no author
- 2(2):68 "USC Library Education Institute Summary"
 by Martha Boaz
- 2(2):105 "Undergraduate Library Conference Report"
 -- no author
- 3(1):35 "Reports from Washington: Two Library
 Training Programs" by John G. Lorenz
- 3(1):41 "Types of Competence to Fill the Libraries'
 Changing Role: A Synthesis of Seminar Reports"
 by Ruth Warnck, compiler
- 3(1):43 "Educating for Librarianship of the Future:
 Research and Training--[Panel Discussion]
- 3(1):53 "Future of Library Education: Proceedings of
 an Institute--Suggestions, Recommendations, and
 Proposals; Appendix [Proposed Amendment to the
 Library Services Act]
- 3(3):173 "Teaching and Practice of Reference Service"
 by Julia Ruth Armstrong
- 3(3):204 "The Life and Times of the Junior Librarian"
 by Carl W. Hintz
- 4(4):191 "The Conferences That Were"
 by Wayne S. Yenawine and Martha Boaz
- 4(4):207 "The Core Reference Course--Discussion Group
 Summary" by Guy A. Marco
- 4(4):216 "The Core Book Selection Course--Discussion
 Group Summary" by Violet L. Coughlin
- 4(4):226 "How Articulate is Our Articulation?--

- Discussion Group Summary" by Carlyle J. Frarey
- 4(4):242 "Cataloguing and Classification--Discussion Group Summary" by Florrinell F. Morton
- 5(1):20 "Reports on Library School Facilities" by:
L.D. Carroll, E. Eisenbach, E.J. Humeston, Jr.,
V. Lawson, C.J. Frarey, R.N. Broadus, and D. Bevis
- 5(2):87 "Library Education--What's Missing?"
--"A Realistic and Mature Selection Process"
by Charles W. Robinson
--"Complex Problems" by Jerrold Orne
--"Select the Students" by Margaret J. Arnold
--"Small Fund of Information" by Ray O. Hummel, Jr.
- 6(1):19 "Teaching the Selection of Library Materials:
An Institute Summary" by Helen Hagan
- 9(4):296 "A Happening at College Park, Maryland"
by Jay E. Daily
- 10(4):271 "A Symposium at Bloomington"
by Jay E. Daily
- 16(4):245 "Three Reviews on Education for Librarianship"
by Robert D. Stevens, J. Periam Danton, and Harold
Lancour
- 18(4):336 "Standards for the Development of Sixth-Year
Programs" [adopted by the] A.A.L.S.
- 19(2):151 "Papers Presented at a Workshop on the
Integrated Core Curriculum--Introduction"
by Mary Lynn Wilson
- 19(3):260 "The Accreditation Process--A Position Paper"
[adopted by the] A.A.L.S.

C. Items Excluded by One Referee Only

- 3(1):30 "Reports from Washington: The Legislative Outlook"
by Germaine Krettek
- 8(4):251 "Reflections on the Doctoral Program ..."
by Margaret Monroe and others
- 15(1):3 "Current Sources of Statistics on Library
Education" by the A.A.L.S. Statistics Committee
- 22(1/2):89 "The Conant Report: Three Deans Speak Out:
-- The Original Proposal" by James D. Ramer
--"The Michigan Site Visit" by Russell E. Bidlack
--"A Comment on the Final Conant Report" by
Richard L. Darling

APPENDIX II

CODES USED FOR PUBLICATION FORMAT OF JEL BIBLIOGRAPHIC CITATIONS IN JEL ARTICLES

| | |
|---|---|
| a | annual reports |
| c | edited collections, anthologies |
| d | dissertations (Doctoral, Masters) |
| h | handbooks, guidebooks, manuals, codes, directories, encyclopedias, reference works, union lists |
| j | journals, bulletins, periodicals |
| l | legislation, acts, statutes, bills |
| m | monographs, occasional papers in series |
| n | newsletters |
| o | other (see list below) |
| p | proceedings, annals, transactions, papers of symposia or conferences, institutes, seminars |
| r | annual reviews |
| t | technical reports, statistical reports, ERIC reports |
| v | newspapers |
| w | personal communications, letters, telephone, interviews |
| y | yearbooks |
| z | non-print media (films, television, motion picture, tape, disc) |
| o | OTHER: addresses, speeches, but if in a journal use j brochures, pamphlets committee records, minutes of committees, meetings course lists, programs, program lists, curricula, syllabus, prospectus plays unpublished manuscripts, mimeographed papers, policy, statements, typescripts, working papers |

APPENDIX III

AUTHORS WHO CONTRIBUTED 4 OR MORE ARTICLES TO JEL, 1960-1983

Bidlack:

- v. 19, spring 1979: "A Statistical Survey of 67 Library Schools, 1978-79"
- 18, spring 1978: "Faculty Salaries of 62 Library Schools, 1977-78"
- 17, spring 1977: "Faculty Salaries of 62 Library Schools, 1976-77"
- 16, spring 1976: "Faculty Salaries of 62 Library Schools, 1975-76"
- 15, winter 1975: "Faculty Salaries of 62 Library Schools, 1974-75"
- 16, winter 1974: "Faculty Salaries of 62 Library Schools, 1973-74"

Galvin:

- v. 18, spring 1978: "The Profession's Response to a Crisis-Based Society"
- 14, spring 1974: "AALS and L.E.D.: A Case for Merger"
- 10, summer 1969: "The Accreditation Controversy: An Essay in Issues and Origins"
- 5, spring 1965: "Teaching Reference with Case Studies: An Interim Report"
- 3, spring 1963: "The Case Technique in Education for Reference Service"

Grotzinger:

- v. 17, fall 1976: "Characteristics of Research Courses in Master's Level Churricula"
- 11, spring 1971: "The Status of 'Practicum' in Graduate Library Schools"
- 10, spring 1970: "Margaret Mann: The Preparatory Years"
- 9, summer 1968: "One Road Through the Wood"

Schick:

- v. 10, fall 1969: "The Statistical State of U.S. Library Education"
- 3, spring 1963: "Library Science Research Needs"
- 3, fall 1962: "Library Science Research"
- 3, summer 1962: "Manpower Shortage and Library Education"

Shera:

- v. 19, summer 1978: "And Gladly Teach"
- 10, summer 1969: "'Twelve Apostles' and a Few Heretics"
- 4, winter 1964: "In Defense of Diversity"
- 1, winter 1961: "An Educational Program for Special Librarians"

Slavens:

- v. 19, winter 1979: "A Study of Library Science Dissertations Accepted by the University of Michigan"
- 11, fall 1970: "Experimenting in Education for Library Associates"
- 10, fall 1969: "Computer-Assisted Instruction for Reference Librarians"
- 9, fall 1968: "Films for Teaching"

Stone:

- v. 14, spring 1974: "A Call for the Continued Autonomy and Independence of AALS"
- 12, spring 1972: "Role of AALS in Lifetime Learning for Librarians"
- 11, summer 1970: "Librarians and Continuing Education"
- 6, summer 1965: "Methods and Materials for Teaching Library Administration"

APPENDIX IV

DATA TABLES SHOWING BIBLIOMETRIC CHARACTERISTICS OF ARTICLES PUBLISHED IN JEL, 1960-1983

TABLE 1. Number and Length of Articles in JEL, 5-Year Groupings

| <u>Years*</u> | <u>Articles</u> | | <u>No. of Articles</u> | <u>Average Length</u> |
|---------------|-----------------|----------|------------------------|-----------------------|
| | <u>No.</u> | <u>%</u> | <u>per Issue</u> | <u>per Article</u> |
| 1960-64 | 90 | 19.0% | 4.5 | 7.6 pages |
| 1965-69 | 115 | 24.3 | 5.8 | 7.5 |
| 1970-74 | 107 | 22.6 | 5.4 | 9.9 |
| 1975-79 | 98 | 20.7 | 4.9 | 11.1 |
| 1980-83 | 63 | 13.3 | 3.9** | 13.7 |
| | --- | ---- | --- | ---- |
| | 473 | 100.0% | 4.9 | 9.6 |

*In all tables, years are organized by volume, and therefore refer to split years; e.g. 1960-64 refers to 1960/61-1964/65.

**Vol.22, issues no.1 and no.2 were combined but have been treated as individual issues in this calculation.

TABLE 2. Proportion of Pages Devoted to Articles in JEL, 5-Year Groupings

| <u>Years</u> | <u>Total pages devoted to:</u> | | | <u>Proportion of Pages devoted to:</u> | |
|--------------|--------------------------------|--------------|--------------|--|--------------|
| | <u>Articles</u> | <u>Other</u> | <u>Total</u> | <u>Articles</u> | <u>Other</u> |
| 1960-64 | 685 pages | 310 pages | 995 pages | 68.8% | 31.2% |
| 1965-69 | 865 | 332 | 1197 | 72.3% | 27.7% |
| 1970-74 | 1063 | 348 | 1411 | 75.3% | 24.7% |
| 1975-79 | 1090 | 418 | 1508 | 72.3% | 27.7% |
| 1980-83 | 861 | 360 | 1221 | 70.5% | 29.5% |
| | ---- | ---- | ---- | | |
| Total | 4564 | 1768 | 6332 | 72.1% | 27.9% |

TABLE 3. Length of Articles in JEL

| <u>Length</u> | <u>Number</u> | <u>Percent</u> |
|---------------|---------------|----------------|
| 2 pages | 3 | .6% |
| 3 | 16 | 3.4 |
| 4 | 27 | 5.7 |
| 5 | 32 | 6.8 |
| 6 | 51 | 10.8 |
| 7 | 59 | 12.5 |
| 8 | 44 | 9.3 |
| 9 | 35 | 7.4 |
| 10 | 36 | 7.6 |
| 11 | 27 | 5.7 |
| 12 | 28 | 5.9 |
| 13 | 28 | 5.9 |
| 14 | 24 | 5.1 |
| 15 | 12 | 2.5 |
| 16 | 11 | 2.3 |
| 17 | 15 | 3.2 |
| 18 | 6 | 1.3 |
| 19 | 3 | .6 |
| 20 | 6 | 1.3 |
| 21 | 2 | .2 |
| 22 | 3 | .6 |
| 24 | 2 | .4 |
| 27 | 1 | .2 |
| 29 | 1 | .2 |
| 33 | 1 | .2 |
| 43 | 1 | .2 |
| | --- | ----- |
| Total | 473 | 100.0% |

TABLE 4. Length of Non-Article Material in JEL, 5-Year Groupings

| <u>Years</u> | <u>Average Length per Issue</u> |
|--------------|-------------------------------------|
| 1960-64 | 15.5 pages |
| 1965-69 | 16.6 |
| 1970-74 | 17.4 |
| 1975-79 | 20.9 |
| 1980-83 | 22.5 |
| | ---- |
| All years | 18.6 |

TABLE 5. Normalized Citations Per Page in JEL Articles

| <u>Citations per article page</u> | <u>Articles</u> | |
|---------------------------------------|-----------------|----------------|
| | <u>No.</u> | <u>Percent</u> |
| 0.00 | 156 | 33.0% |
| .01 to .49 | 87 | 18.4 |
| .50 to .99 | 94 | 19.9 |
| 1.00 to 1.49 | 61 | 12.9 |
| 1.50 to 1.99 | 30 | 6.3 |
| 2.00 to 2.99 | 34 | 7.2 |
| 3.00 to 3.99 | 9 | 1.9 |
| 4.00 to 4.99 | 1 | .2 |
| 5.00 to 5.99 | 1 | .2 |
| | --- | ----- |
| Total | 473 | 100.0% |

TABLE 6. Average Citations Per Page in JEL Articles, 5-Year Groupings

| <u>Years</u> | <u>Citations per referenced article page</u> | |
|--------------|--|---------------|
| | <u>Mean</u> | <u>Median</u> |
| 1960-64 | 0.9 | 0.6 |
| 1965-69 | 1.0 | 0.8 |
| 1970-74 | 1.0 | 0.8 |
| 1975-79 | 1.2 | 1.0 |
| 1980-83 | 1.2 | 0.9 |

TABLE 7. Most Frequent Subjects in JEL Articles, 5-Year Groupings

| <u>Subject</u> | <u>Number of Mentions</u> | | | | <u>Total Mentions</u> | |
|---|---------------------------|----------------|----------------|----------------|-----------------------|----------|
| | <u>1960-64</u> | <u>1965-69</u> | <u>1970-74</u> | <u>1975-79</u> | <u>No.</u> | <u>%</u> |
| International and comparative library education | 3 | 20 | 9 | 4 | 36 | 5.3% |
| Library education (national reports) | 3 | 17 | 9 | 4 | 33 | 4.9 |
| Reference services--curriculum | 8 | 7 | 6 | 7 | 28 | 4.1 |
| Curriculum--design and development | 2 | 6 | 5 | 12 | 25 | 3.7 |
| Library education--aims and objectives | 10 | 2 | 4 | 8 | 24 | 3.5 |
| Curriculum--core courses | 8 | 6 | 2 | 5 | 21 | 3.1 |
| Cataloguing and classification--curriculum | 6 | 3 | - | 4 | 13 | 1.9 |
| Library education--philosophy | 3 | 5 | 2 | 1 | 11 | 1.6 |
| Special librarianship--curriculum | 4 | 1 | 5 | 1 | 11 | 1.6 |
| Academic librarianship | 4 | 3 | 3 | - | 10 | 1.5 |
| Book selection--curriculum | 2 | 2 | 6 | - | 10 | 1.5 |
| Curriculum--aims and objectives | 5 | 4 | 1 | - | 10 | 1.5 |
| Library schools--faculty | 3 | 4 | - | 3 | 10 | 1.5 |
| All subjects | | | | | 679 | 100.0% |

*Based on subject heading assignments in the JEL Cumulative Indexes 1960-1975 and 1975-1980; 1981-84 subject headings not available. Number of articles indexed = 410.

TABLE 8. Scholarliness of Articles in JEL, 5-Year Groupings

| | Number of Articles | | | Proportion of Articles | |
|---------|---------------------------------|------------------------------------|--------------|---------------------------------|------------------------------------|
| | <u>with</u> <u>citations</u> | <u>without</u> <u>citations</u> | <u>Total</u> | <u>with</u> <u>citations</u> | <u>without</u> <u>citations</u> |
| 1960-64 | 42 | 48 | 90 | 46.7% | 53.3% |
| 1965-69 | 61 | 54 | 115 | 53.0% | 47.0% |
| 1970-74 | 75 | 32 | 107 | 70.1% | 29.9% |
| 1975-79 | 80 | 18 | 98 | 81.6% | 18.4% |
| 1980-83 | 59 | 4 | 63 | 93.7% | 6.3% |
| | --- | --- | --- | | |
| Total | 317 | 156 | 473 | 67.0 | 33.0% |

TABLE 9. Authorship of Articles in JEL, 5-Year Groupings

| | Authorship of Articles | | | Proportion | |
|---------|------------------------|--------------------------|--------------|---------------|--------------------------|
| | <u>Single</u> | <u>Joint & multi</u> | <u>Total</u> | <u>Single</u> | <u>Joint & multi</u> |
| 1960-64 | 88 | 2 | 90 | 97.8% | 2.2% |
| 65-69 | 111 | 4 | 115 | 96.5% | 3.5% |
| 70-74 | 85 | 22 | 107 | 79.4% | 20.6% |
| 75-79 | 73 | 25 | 98 | 74.5% | 25.5% |
| 80-83 | 42 | 21 | 63 | 66.7% | 33.3% |
| | --- | -- | --- | | |
| Total | 399 | 74 | 473 | 84.4% | 15.6% |

TABLE 10. Articles in JEL by Occupation of First Authors, 5-Year Groupings

| Occupational Status | | | | | | | | | | | |
|---------------------|----------|---------------|----------|------------|----------|------------|----------|--------------|----------|------------|----------|
| Educators | | Practitioners | | Students | | | | Unidentified | | Total | |
| | | | | Master's | | Doctoral | | | | | |
| <u>No.</u> | <u>%</u> | <u>No.</u> | <u>%</u> | <u>No.</u> | <u>%</u> | <u>No.</u> | <u>%</u> | <u>No.</u> | <u>%</u> | <u>No.</u> | <u>%</u> |
| 1960-64 | 55 61.1% | 28 | 31.1% | 4 | 4.4% | 1 | 1.1% | 2 | 2.2% | 90 | 71.9% |
| 1965-69 | 85 73.9 | 25 | 21.7 | 3 | 2.6 | 2 | 1.7 | | | 115 | 21.1 |
| 1970-74 | 79 73.8 | 18 | 16.8 | 3 | 2.8 | 7 | 6.5 | | | 107 | 3.2 |
| 1975-79 | 75 76.5 | 17 | 17.3 | | | 5 | 5.1 | 1 | 1.0 | 98 | 2.5 |
| 1980-83 | 46 73.0 | 12 | 19.0 | 2 | 3.2 | | | 3 | 4.8 | 63 | 1.3 |
| --- | | --- | | -- | | -- | | --- | | --- | |
| Total | 340 71.9 | 100 | 21.1 | 12 | 2.5 | 15 | 3.2 | 6 | 1.3 | 473 | 100.0 |

TABLE 11. Articles in JEL by Occupation of Second Author

| <u>Occupational Status</u> | <u>Articles</u> | |
|----------------------------|-----------------|----------------|
| | <u>Number</u> | <u>Percent</u> |
| Educators | 43 | 58.1% |
| Practitioners | 21 | 28.4 |
| Students-doctoral | 5 | 6.8 |
| -master's | 3 | 4.0 |
| Unidentified | 2 | 2.7 |
| --- | -- | ----- |
| Total | 74 | 100.0% |

TABLE 12. Articles in JEL by Geographic Location of First Author

| <u>Location</u> | <u>Articles</u> | |
|---|-----------------|----------------|
| | <u>Number</u> | <u>Percent</u> |
| U.S.A. | 425 | 90.2% |
| Canada | 13 | 2.7 |
| U.K. | 11 | 2.3 |
| Australia | 4 | .8 |
| Nigeria | 4 | .8 |
| Japan | 3 | .6 |
| China, Nationalist Republic (Taiwan) | 2 | .4 |
| Czechoslovakia | 1 | .2 |
| Fiji | 1 | .2 |
| Israel | 1 | .2 |
| Lebanon | 1 | .2 |
| New Zealand | 1 | .2 |
| Phillipines | 1 | .2 |
| South Africa | 1 | .2 |
| Thailand | 1 | .2 |
| U.S.S.R. | 1 | .2 |
| West Germany | 1 | .2 |
| Unidentified | 1 | .2 |
| | --- | ---- |
| Total | 473 | 100.0% |

TABLE 13. Articles in JEL by Geographic Location of First Author, 5-Year Groupings

| <u>Location</u> | <u>1960-64</u> | <u>1965-69</u> | <u>1970-74</u> | <u>1975-79</u> | <u>1980-84</u> | <u>Total No.</u> | <u>%</u> |
|---|----------------|----------------|----------------|----------------|----------------|----------------------|----------|
| U.S.A. | 86 | 98 | 100 | 89 | 52 | 425 | 90.2% |
| Canada | 1 | 3 | 3 | 4 | 2 | 13 | 2.7 |
| U.K. | | 6 | 2 | 1 | 2 | 11 | 2.3 |
| Australia | | 2 | | 1 | 1 | 4 | .8 |
| Nigeria | | | 1 | 2 | 1 | 4 | .8 |
| Japan | 1 | 1 | | | 1 | 3 | .6 |
| China, Nationalist Republic (Taiwan) | | 1 | 1 | | | 2 | .4 |
| Czechoslovakia | | 1 | | | | 1 | |
| Fiji | | 1 | | | | 1 | |
| Israel | | | | | 1 | 1 | |
| Lebanon | | | | 1 | | 1 | |
| New Zealand | | | | | 1 | 1 | .2 |
| Phillipines | | 1 | | | | 1 | |
| South Africa | | 1 | | | | 1 | |
| Thailand | | 1 | | | | 1 | |
| U.S.S.R. | 1 | | | | | 1 | |
| West Germany | | | | | 1 | 1 | |
| Unidentified | | | | | 1 | 1 | |
| Total | --- | --- | --- | --- | --- | --- | --- |
| | 90 | 115 | 107 | 98 | 63 | 473 | 100.0% |

TABLE 14. Articles in JEL by Most Frequent State of U.S.A. First Author

| <u>State</u> | <u>Articles</u> | |
|----------------------|-----------------|----------------|
| | <u>Number</u> | <u>Percent</u> |
| New York | 44 | 10.4% |
| Illinois | 41 | 9.6 |
| Michigan | 36 | 8.5 |
| California | 31 | 7.3 |
| Pennsylvania | 30 | 7.1 |
| Ohio | 29 | 6.8 |
| Wisconsin | 21 | 5.0 |
| District of Columbia | 17 | 4.0 |
| Indiana | 17 | 4.0 |
| North Carolina | 17 | 4.0 |
| Texas | 17 | 4.0 |
| Florida | 13 | 3.0 |
| Kentucky | 12 | 2.8 |
| New Jersey | 12 | 2.8 |
| Other States | 88 | 20.7 |
| | --- | ---- |
| Total | 425 | 100.0% |

TABLE 15. Articles in JEL by Most Frequent State of U.S.A. First Author, 5-Year Groupings

| <u>State</u> | <u>1960-64</u> | <u>1965-69</u> | <u>1970-74</u> | <u>1975-79</u> | <u>1980-83</u> | <u>Total</u> |
|----------------------|----------------|----------------|----------------|----------------|----------------|--------------|
| California | 5 | 6 | 8 | 4 | 8 | 31 |
| District of Columbia | 10 | 1 | 3 | 3 | | 17 |
| Florida | 2 | 2 | 4 | 3 | 2 | 13 |
| Illinois | 15 | 9 | 6 | 4 | 7 | 41 |
| Indiana | 1 | 2 | 5 | 6 | 3 | 17 |
| Kentucky | 1 | 4 | 5 | 2 | | 12 |
| Michigan | 3 | 12 | 7 | 11 | 3 | 36 |
| North Carolina | 1 | | 2 | 10 | 4 | 17 |
| New Jersey | 7 | 4 | 1 | | | 12 |
| New York | 14 | 10 | 10 | 7 | 3 | 44 |
| Ohio | 5 | 8 | 10 | 4 | 2 | 29 |
| Pennsylvania | 4 | 11 | 7 | 6 | 2 | 30 |
| Texas | 1 | 1 | 3 | 10 | 2 | 17 |
| Wisconsin | 4 | 11 | 3 | 1 | 2 | 21 |
| Other States | 14 | 16 | 26 | 18 | 14 | 88 |
| | -- | --- | --- | -- | -- | --- |
| Total | 90 | 115 | 107 | 98 | 52 | 425 |

TABLE 16. Gender of First Authors of Articles in JEL

| | <u>Number</u> | <u>Percent</u> |
|-------------------------|---------------|----------------|
| Female | 162 | 34.2% |
| Male | 285 | 60.3 |
| Could not be identified | 26 | 5.5 |
| | --- | ---- |
| Total | 473 | 100.0% |

TABLE 17. Gender of Second Authors of Articles in JEL

| | <u>Number</u> | <u>Percent</u> |
|-------------------------|---------------|----------------|
| Female | 33 | 44.6% |
| Male | 36 | 48.6 |
| Could not be identified | 5 | 6.8 |
| | -- | ---- |
| Total | 74 | 100.0% |

TABLE 18. Productivity of First Authors in JEL

| Number of Articles | Number of Authors* | Cumulative Frequency Authors | | Cumulative Frequency Articles | |
|--------------------------|--------------------------|---------------------------------|---------|----------------------------------|---------|
| | | Number | Percent | Number | Percent |
| 1 | 297 | 297 | 81.1% | 297 | 62.8% |
| 2 | 41 | 338 | 92.3 | 379 | 80.1 |
| 3 | 21 | 359 | 98.1 | 442 | 93.4 |
| 4 | 5 | 364 | 99.5 | 462 | 97.7 |
| 5 | 1 | 365 | 99.7 | 467 | 98.7 |
| 6 | 1 | 366 | 100.0 | 473 | 100.0 |

*excluding their productivity if second-named authors

TABLE 19. Productivity of Second and Multi Authors in JEL

| Number of Articles | Number of Authors* | Cumulative Frequency Authors | | Cumulative Frequency Articles | |
|--------------------------|--------------------------|---------------------------------|-------|----------------------------------|-------|
| | | No. | % | No. | % |
| 1 | 70 | 70 | 97.2% | 70 | 94.6% |
| 2 | 2 | 72 | 100.0 | 74 | 100.0 |

*excluding their productivity if first-named authors

APPENDIX V

DATA TABLES SHOWING BIBLIOMETRIC CHARACTERISTICS OF WORKS
CITED IN JEL ARTICLES, 1960-1983Table 1. Works Cited in JEL Articles, 5-Year Groupings

| Years | Total Citations | Average Citations per Referenced Article | Average Citations per All Articles |
|---------|-----------------|--|------------------------------------|
| ----- | ----- | ----- | ----- |
| 1960-64 | 315 | 7.5 | 3.5 |
| 1965-69 | 496 | 7.5 | 4.3 |
| 1970-74 | 762 | 10.2 | 7.1 |
| 1975-79 | 1067 | 13.3 | 10.9 |
| 1980-83 | 1015 | 17.2 | 16.1 |
| ----- | ----- | ----- | ----- |
| Total | 3655 | 11.5 | 7.7 |

Table 2. Works Cited in JEL Articles,
by Refereeing Policy

| | Total Citations | Average Citations per Referenced Article | Average Citations for All Articles |
|-------------------------------|-----------------|--|------------------------------------|
| | ----- | ----- | ----- |
| Before refereeing (1960-1970) | 994 | 8.1 | 4.3 |
| After refereeing (1971-1983) | 2661 | 13.6 | 11.0 |
| ----- | ----- | ----- | ----- |
| Total | 3655 | 11.5 | 7.7 |

Table 3.

Frequency of Citations in JEL Articles,
5-Year Groupings

| Citations Per Article | 1960-64 | | 1965-69 | | 1970-74 | | 1975-79 | | 1980-83 | | Total | |
|--------------------------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|-------|--------|
| | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. |
| 0 | 48 | 53.3% | 54 | 47.0% | 32 | 29.9% | 18 | 18.4% | 4 | 6.3% | 156 | 33.0% |
| 1- 4 | 22 | 24.5 | 26 | 22.6 | 23 | 21.5 | 14 | 14.2 | 10 | 15.9 | 95 | 20.1 |
| 5- 9 | 10 | 11.1 | 17 | 14.8 | 22 | 20.6 | 24 | 24.5 | 12 | 19.0 | 85 | 17.9 |
| 10-14 | 5 | 5.6 | 8 | 7.0 | 10 | 9.3 | 14 | 14.3 | 11 | 17.5 | 48 | 10.2 |
| 15-19 | 1 | 1.1 | 2 | 1.7 | 9 | 8.4 | 10 | 10.2 | 9 | 14.3 | 31 | 6.6 |
| 20-24 | 1 | 1.1 | 6 | 5.2 | 6 | 5.6 | 5 | 5.1 | 3 | 4.8 | 21 | 4.4 |
| 25+ | 3 | 3.3 | 2 | 1.7 | 5 | 4.7 | 13 | 13.3 | 14 | 22.2 | 37 | 7.8 |
| Total | 90 | 100.0% | 115 | 100.0% | 107 | 100.0% | 98 | 100.0% | 63 | 100.0% | 473 | 100.0% |

Table 4. Frequency of Citations in JEL Articles

| Citations Per Article | No. of Articles | Total Citations | Cumulative Frequency | | Articles | |
|--------------------------|--------------------|--------------------|----------------------|-------|----------|-------|
| | | | Citations No. | P. | No. | P. |
| 0 | 156 | 0 | 0 | 0% | 156 | 33.0% |
| 1 | 30 | 30 | 30 | .8 | 186 | 39.4 |
| 2 | 30 | 60 | 90 | 2.4 | 216 | 45.7 |
| 3 | 19 | 57 | 147 | 4.0 | 235 | 49.7 |
| 4 | 16 | 64 | 211 | 5.8 | 251 | 53.1 |
| 5 | 15 | 75 | 286 | 7.8 | 266 | 56.3 |
| 6 | 17 | 102 | 388 | 10.6 | 283 | 59.9 |
| 7 | 15 | 105 | 493 | 13.4 | 298 | 63.1 |
| 8 | 21 | 162 | 661 | 18.1 | 319 | 67.5 |
| 9 | 17 | 153 | 814 | 22.3 | 336 | 71.1 |
| 10 | 17 | 170 | 984 | 26.9 | 353 | 74.7 |
| 11 | 13 | 143 | 1127 | 30.1 | 366 | 77.5 |
| 12 | 5 | 60 | 1187 | 32.5 | 371 | 78.6 |
| 13 | 10 | 130 | 1317 | 36.0 | 381 | 80.7 |
| 14 | 3 | 42 | 1359 | 37.1 | 384 | 81.3 |
| 15 | 5 | 75 | 1434 | 39.2 | 389 | 82.4 |
| 16 | 7 | 112 | 1546 | 42.3 | 396 | 83.8 |
| 17 | 7 | 119 | 1665 | 45.6 | 403 | 85.3 |
| 18 | 6 | 108 | 1773 | 48.5 | 409 | 86.6 |
| 19 | 6 | 114 | 1887 | 51.6 | 415 | 87.9 |
| 20 | 5 | 100 | 1987 | 54.4 | 420 | 88.9 |
| 21 | 5 | 105 | 2092 | 57.2 | 425 | 90.0 |
| 22 | 6 | 132 | 2224 | 60.8 | 431 | 91.3 |
| 23 | 3 | 69 | 2293 | 62.7 | 434 | 91.9 |
| 24 | 2 | 48 | 2341 | 64.0 | 436 | 92.3 |
| 25 | 4 | 100 | 2441 | 66.7 | 440 | 93.2 |
| 26 | 3 | 78 | 2519 | 68.9 | 443 | 93.8 |
| 27 | 1 | 27 | 2546 | 69.7 | 444 | 94.0 |
| 28 | 2 | 56 | 2602 | 71.2 | 446 | 94.5 |
| 29 | 3 | 87 | 2689 | 73.6 | 449 | 95.1 |
| 30 | 1 | 30 | 2719 | 74.4 | 450 | 95.3 |
| 31 | 4 | 124 | 2843 | 77.7 | 454 | 96.2 |
| 32 | 2 | 64 | 2907 | 79.5 | 456 | 96.6 |
| 35 | 2 | 70 | 2977 | 81.6 | 458 | 97.0 |
| 36 | 1 | 36 | 3013 | 82.4 | 459 | 97.2 |
| 37 | 2 | 74 | 3087 | 84.5 | 461 | 97.5 |
| 39 | 1 | 39 | 3126 | 85.5 | 462 | 97.6 |
| 40 | 2 | 80 | 3206 | 87.7 | 464 | 98.1 |
| 41 | 2 | 82 | 3288 | 89.9 | 466 | 98.5 |
| 45 | 1 | 45 | 3333 | 91.9 | 467 | 98.7 |
| 46 | 2 | 92 | 3425 | 93.7 | 469 | 99.2 |
| 51 | 1 | 51 | 3476 | 95.1 | 470 | 99.3 |
| 53 | 1 | 53 | 3529 | 96.6 | 471 | 99.5 |
| 60 | 1 | 60 | 3589 | 98.1 | 472 | 99.7 |
| 66 | 1 | 66 | 3655 | 100.0 | 473 | 100.0 |

Table 5. Age of Works Cited in JEL Articles--Summary

| Age in years ----- | Citations | | Cumulative Frequency | |
|-----------------------|--------------|-------------|----------------------|-------------|
| | No. ----- | P. ----- | No. ----- | P. ----- |
| less than 1 | 77 | 2.1% | 77 | 2.1% |
| 1-4 | 1596 | 43.6 | 1673 | 45.7 |
| 5-9 | 911 | 25.0 | 2584 | 70.7 |
| 10-14 | 397 | 10.8 | 2981 | 81.5 |
| 15-19 | 207 | 5.7 | 3188 | 87.2 |
| 20-24 | 108 | 2.9 | 3296 | 90.1 |
| 25-29 | 74 | 2.0 | 3370 | 92.1 |
| 30-39 | 67 | 1.8 | 3437 | 93.9 |
| 40-49 | 83 | 2.3 | 3520 | 96.2 |
| 50-99 | 78 | 2.2 | 3598 | 98.4 |
| 100-174 | 6 | .2 | 3604 | 98.6 |
| Unknown | 51 | 1.4 | 3655 | 100.0 |
| ----- | ----- | ----- | ----- | ----- |
| Total | 3655 | 100.0% | 3655 | 100.0% |

Table 6. Age of Works Cited in JEL Articles

| Age in years ----- | Citations | | Cumulative Frequency | |
|-----------------------|--------------|-------------|----------------------|-------------|
| | No. ----- | P. ----- | No. ----- | P. ----- |
| less than 1 | 77 | 2.1% | 77 | 2.1% |
| 1 | 394 | 10.8 | 471 | 12.9 |
| 2 | 486 | 13.3 | 957 | 26.2 |
| 3 | 396 | 10.8 | 1353 | 37.0 |
| 4 | 320 | 8.8 | 1673 | 45.8 |
| 5 | 224 | 6.1 | 1897 | 51.9 |
| 6 | 213 | 5.8 | 2110 | 57.7 |
| 7 | 169 | 4.6 | 2280 | 62.4 |
| 8 | 177 | 4.8 | 2456 | 67.2 |
| 9 | 128 | 3.5 | 2586 | 70.7 |
| 10 | 122 | 3.3 | 2707 | 74.0 |
| 11 | 90 | 2.5 | 2796 | 76.4 |
| 12 | 75 | 2.1 | 2871 | 78.5 |
| 13 | 68 | 1.9 | 2939 | 80.4 |
| 14 | 42 | 1.1 | 2981 | 81.5 |
| 15 | 68 | 1.9 | 3049 | 83.4 |
| 16 | 36 | 1.0 | 3085 | 84.4 |
| 17 | 42 | 1.1 | 3127 | 85.6 |
| 18 | 33 | .9 | 3160 | 86.5 |
| 19 | 28 | .8 | 3188 | 87.2 |
| 20-24 | 108 | 2.9 | 3296 | 90.2 |
| 25-29 | 74 | 2.0 | 3370 | 92.2 |
| 30-39 | 67 | 1.8 | 3437 | 94.0 |
| 40-49 | 83 | 2.2 | 3520 | 96.3 |
| 50-59 | 42 | 1.1 | 3562 | 97.5 |
| 60-69 | 13 | .3 | 3575 | 97.8 |
| 70-79 | 18 | .4 | 3593 | 98.3 |
| 80-89 | 4 | .1 | 3597 | 98.4 |
| 90-99 | 1 | .1 | 3598 | 98.4 |
| 103 | 1 | .1 | 3599 | 98.4 |
| 134 | 1 | .1 | 3600 | 98.4 |
| 163 | 1 | .1 | 3601 | 98.4 |
| 165 | 2 | .1 | 3603 | 98.4 |
| 174 | 1 | .1 | 3604 | 98.5 |
| Unknown | 51 | 1.4 | 3655 | 98.6 |
| ----- | ----- | ----- | ----- | ----- |
| Total | 3655 | 100.0% | 3655 | 100.0% |

Table 7.

Publication Format of Works Cited
in JEL Articles

| Format | Citations | |
|-------------------------|-----------|--------|
| | No. | P. |
| ----- | ----- | ----- |
| Journals | 1483 | 40.6% |
| Monographs | 910 | 24.9 |
| Edited Collections | 263 | 7.2 |
| Handbooks, guidebooks | 213 | 5.8 |
| Technical reports | 138 | 3.8 |
| Proceedings | 123 | 3.4 |
| Dissertations | 77 | 2.1 |
| Personal communications | 69 | 1.9 |
| Newsletters | 49 | 1.3 |
| Yearbooks | 35 | 1.0 |
| Annual Reviews | 25 | .7 |
| Newspapers | 22 | .6 |
| Non-print media | 16 | .4 |
| Annual reports | 10 | .3 |
| Legislation | 8 | .2 |
| Other | 214 | 5.8 |
| ----- | ----- | ----- |
| Total | 3655 | 100.0% |

Table 8. Publication Format of Works Cited in JEL Article,
5-Year Groupings

| Years | Journals | | Monographs | | Edited Collect. | | Hdbks. Gdbks | | Tech. Reps. | | All Formats | |
|---------|----------|--------|------------|--------|-----------------|--------|--------------|--------|-------------|--------|-------------|--------|
| | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. |
| 1960-64 | 136 | 9.1% | 75 | 8.2% | 30 | 11.4% | 8 | 3.7% | 5 | 3.6% | 315 | 8.6% |
| 1965-69 | 185 | 12.5 | 125 | 13.8 | 44 | 16.7 | 29 | 13.6 | 8 | 5.8 | 496 | 13.6 |
| 1970-74 | 316 | 21.3 | 204 | 22.4 | 48 | 18.3 | 35 | 16.5 | 36 | 26.1 | 762 | 20.8 |
| 1975-79 | 384 | 25.9 | 260 | 28.6 | 72 | 27.4 | 78 | 36.6 | 53 | 38.4 | 1067 | 29.2 |
| 1980-83 | 462 | 31.2 | 246 | 27.0 | 69 | 26.2 | 63 | 29.6 | 36 | 26.1 | 1015 | 27.8 |
| Total | 1483 | 100.0% | 910 | 100.0% | 263 | 100.0% | 213 | 100.0% | 138 | 100.0% | 3655 | 100.0% |

Table 9.

Citation Yield of Journals Cited
in JEL Articles

| Number of Journals | Number of Citations | Cumulative Frequency | | | |
|-----------------------|------------------------|----------------------|-------|-----------|-------|
| | | Journals | | Citations | |
| | | No. | P. | No. | P. |
| 1 | 285 | 1 | .3% | 285 | 19.0% |
| 1 | 120 | 2 | .6 | 405 | 27.1 |
| 1 | 67 | 3 | 1.0 | 472 | 31.5 |
| 1 | 58 | 4 | 1.3 | 530 | 35.4 |
| 1 | 56 | 5 | 1.7 | 586 | 39.2 |
| 1 | 42 | 6 | 2.0 | 628 | 41.9 |
| 1 | 38 | 7 | 2.0 | 666 | 44.5 |
| 1 | 36 | 8 | 2.7 | 702 | 46.9 |
| 1 | 28 | 9 | 3.1 | 730 | 48.8 |
| 2 | 27 | 11 | 3.8 | 784 | 52.4 |
| 1 | 23 | 12 | 4.1 | 807 | 53.9 |
| 2 | 21 | 14 | 4.7 | 849 | 56.7 |
| 1 | 18 | 15 | 5.1 | 867 | 57.9 |
| 1 | 16 | 16 | 5.5 | 883 | 58.9 |
| 1 | 15 | 17 | 5.8 | 898 | 59.9 |
| 1 | 14 | 18 | 6.1 | 912 | 60.9 |
| 1 | 13 | 19 | 6.5 | 925 | 61.7 |
| 2 | 12 | 21 | 7.2 | 949 | 63.4 |
| 1 | 11 | 22 | 7.5 | 960 | 64.1 |
| 4 | 9 | 26 | 8.9 | 996 | 66.5 |
| 3 | 8 | 29 | 9.9 | 1020 | 68.1 |
| 4 | 7 | 33 | 11.3 | 1048 | 70.0 |
| 4 | 6 | 37 | 12.6 | 1072 | 71.6 |
| 11 | 5 | 48 | 16.4 | 1127 | 75.2 |
| 16 | 4 | 64 | 21.8 | 1191 | 79.6 |
| 18 | 3 | 82 | 27.9 | 1245 | 83.2 |
| 41 | 2 | 123 | 41.9 | 1327 | 88.6 |
| 170 | 1 | 293 | 100.0 | 1497 | 100.0 |

Table 10.

The Six Most Cited Journals in JEL Articles.
5-Year Groupings

| Years | JEL | | LJ | | AL/ALAB | | CRL | | LQ | | LT | |
|---------|-----|--------|-----|--------|---------|--------|-----|--------|-----|--------|-----|--------|
| | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. |
| 1960-64 | 16 | 5.6% | 27 | 22.5% | 8 | 12.0% | 11 | 19.0% | 14 | 25.0% | 5 | 11.9% |
| 1965-69 | 29 | 10.2 | 30 | 25.0 | 12 | 17.9 | 12 | 20.7 | 5 | 8.9 | 9 | 21.4 |
| 1970-74 | 74 | 26.0 | 13 | 10.8 | 8 | 12.0 | 10 | 17.2 | 12 | 21.4 | 9 | 21.4 |
| 1975-79 | 63 | 22.1 | 28 | 23.3 | 22 | 32.8 | 14 | 24.1 | 17 | 30.4 | 12 | 28.6 |
| 1980-83 | 103 | 36.1 | 22 | 18.3 | 17 | 25.3 | 11 | 19.0 | 8 | 14.3 | 7 | 16.7 |
| Total | 285 | 100.0% | 120 | 100.0% | 67 | 100.0% | 58 | 100.0% | 56 | 100.0% | 42 | 100.0% |

Table 11. Subject Discipline of Journals Cited 2 or
More Times in JEL Articles

| Field* | Total Journals | Total Citations | Citations Per Journal |
|---------------------------------|-------------------|--------------------|--------------------------|
| ----- | ----- | ----- | ----- |
| Business/Economics | 1 | 5 | 5 |
| Education | 22 | 80 | 4 |
| General Interest-U.S.A. | 1 | 2 | 2 |
| Humanities-Comprehensive | 1 | 2 | 2 |
| Law | 1 | 3 | 3 |
| Library and Information Science | 56 | 1084 | 19 |
| Linguistics | 1 | 7 | 7 |
| Literature | 1 | 2 | 2 |
| Literary/Political Reviews | 1 | 2 | 2 |
| Photography | 1 | 2 | 2 |
| Political Science | 1 | 4 | 4 |
| Psychology | 11 | 37 | 3 |
| Public Administration | 1 | 4 | 4 |
| Publishing and Book Trade | 1 | 2 | 2 |
| Sciences-Comprehensive | 2 | 12 | 6 |
| Social Sciences-Comprehensive | 1 | 2 | 2 |
| Sociology | 4 | 9 | 2 |
| Theater | 1 | 8 | 8 |
| ----- | ----- | ----- | ----- |
| Total | 108 | 1262 | 12 |

*As listed in Ulrich's International Periodical Directory,
23rd ed., 1984.

Table 12. Citation Yield of First Authors Cited in JEL Articles*

| Number of Citations ----- | Number of Authors ----- | Cumulative Frequency | | | |
|---------------------------------|-------------------------------|----------------------|--------|---------|--------|
| | | Citations | | Authors | |
| | | No. | P. | No. | P. |
| | | ----- | ----- | ----- | ----- |
| 1 | 1407 | 1407 | 41.9% | 1407 | 72.2% |
| 2 | 283 | 1973 | 58.7 | 1690 | 86.7 |
| 3 | 112 | 2309 | 68.7 | 1802 | 92.4 |
| 4 | 57 | 2537 | 75.5 | 1859 | 95.3 |
| 5 | 27 | 2672 | 79.5 | 1886 | 96.7 |
| 6 | 20 | 2792 | 83.1 | 1906 | 97.7 |
| 7 | 11 | 2869 | 85.4 | 1917 | 98.3 |
| 8 | 12 | 2965 | 88.2 | 1929 | 98.9 |
| 9 | 4 | 3001 | 89.3 | 1933 | 99.1 |
| 10 | 2 | 3021 | 89.9 | 1935 | 99.2 |
| 11 | 1 | 3032 | 90.2 | 1936 | 99.2 |
| 12 | 1 | 3044 | 90.6 | 1937 | 99.3 |
| 13 | 3 | 3082 | 91.7 | 1940 | 99.4 |
| 15 | 1 | 3098 | 92.2 | 1941 | 99.5 |
| 18 | 1 | 3116 | 92.7 | 1942 | 99.5 |
| 19 | 2 | 3154 | 93.9 | 1944 | 99.6 |
| 22 | 2 | 3204 | 95.4 | 1946 | 99.7 |
| 25 | 1 | 3229 | 96.1 | 1947 | 99.8 |
| 26 | 1 | 3255 | 96.8 | 1948 | 99.8 |
| 33 | 1 | 3288 | 97.9 | 1949 | 99.9 |
| 72 | 1 | 3360 | 100.0% | 1950 | 100.0% |

*Some cited works had an editor only, while others were anonymous or authorship was missing from the bibliographic entry.

Table 13. Citation Yield of Second Authors* Cited in JEL Articles

| Number of Citations | Number of Authors | Cumulative Frequency | | | |
|---------------------|-------------------|----------------------|-------|---------|-------|
| | | Citations | | Authors | |
| ----- | ----- | No. | P. | No. | P. |
| ----- | ----- | ----- | ----- | ----- | ----- |
| 1 | 280 | 280 | 63.3% | 280 | 80.9% |
| 2 | 47 | 374 | 84.6 | 327 | 94.5 |
| 3 | 13 | 413 | 93.4 | 340 | 98.3 |
| 4 | 2 | 421 | 95.2 | 342 | 98.8 |
| 5 | 3 | 436 | 98.6 | 345 | 99.7 |
| 6 | 1 | 442 | 100.0 | 346 | 100.0 |

* co-authored and second-named of multi-authored works.

Table 14.

Citation Yield of Editors Cited in
JEL Articles

| Number of Citations ----- | Number of Editors* | Cumulative Frequency | | | |
|---------------------------------|-----------------------|----------------------|--------|---------|--------|
| | | Citations | | Editors | |
| | | No. | P. | No. | P. |
| | | ----- | ----- | ----- | ----- |
| 1 | 149 | 149 | 42.6% | 149 | 69.9% |
| 2 | 35 | 219 | 62.6 | 184 | 86.4 |
| 3 | 15 | 264 | 75.4 | 199 | 93.4 |
| 4 | 4 | 280 | 80.0 | 203 | 95.3 |
| 5 | 6 | 310 | 88.6 | 209 | 98.1 |
| 6 | 1 | 316 | 90.2 | 210 | 98.6 |
| 8 | 1 | 324 | 92.6 | 211 | 99.1 |
| 11 | 1 | 335 | 95.7 | 212 | 99.5 |
| 15 | 1 | 350 | 100.0% | 213 | 100.0% |

*126 citations were to editor-only titles (103 editors).

TABLE 15.

Type of Authorship of Works Cited in
JEL Articles

| Authorship ----- | Citations | |
|---------------------|--------------|-------------|
| | No. ----- | P. ----- |
| Single | 2395 | 65.5% |
| Joint | 374 | 10.2 |
| Multi | 127 | 3.5 |
| Editor only | 139 | 3.8 |
| Corporate | 429 | 11.7 |
| Not Given | 191 | 5.2 |
| ----- | ----- | ----- |
| Total | 3655 | 100.0% |

Table 16.

Type of Authorship of Works Cited in
JEL Articles, 5-Year Groupings

| Years | Single | | Joint(co-) | | Multi | | Editor | | Corporate | | Not Given | | Total |
|---------|--------|--------|------------|--------|-------|--------|--------|--------|-----------|--------|-----------|--------|-------|
| | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. | No. | P. | |
| 1960-64 | 224 | 9.4% | 12 | 3.2% | 4 | 3.1 | 10 | 7.2% | 39 | 9.1% | 26 | 13.6% | 315 |
| 1965-69 | 341 | 14.2 | 24 | 6.4 | 11 | 8.7 | 24 | 17.3 | 59 | 13.8 | 37 | 19.4 | 496 |
| 1970-74 | 524 | 21.9 | 85 | 22.7 | 32 | 25.2 | 28 | 20.1 | 65 | 15.1 | 28 | 14.7 | 762 |
| 1975-79 | 659 | 27.5 | 114 | 30.5 | 41 | 32.3 | 48 | 34.5 | 153 | 35.7 | 52 | 27.2 | 1067 |
| 1980-83 | 647 | 27.0 | 139 | 37.2 | 39 | 30.7 | 29 | 20.9 | 113 | 26.3 | 48 | 25.1 | 1015 |
| Total | 2395 | 100.0% | 374 | 100.0% | 127 | 100.0% | 139 | 100.0% | 429 | 100.0% | 191 | 100.0% | 3655 |

Table 17.

Application of a Bradford Distribution
to Journal Citations in JEL Articles, 1960-1983

Calculations:

| Predicted Zone Size (Cumulative) | Observed Journal Rank (Cumulative) | Normalized Zone Series | Zone Ratios | Predicted End Ranks (Cumulative) | Deviation (Predicted- Observed) |
|--|--|------------------------------|----------------|--|---------------------------------------|
| m=530 | 4 | 4-4=1 | 35-4=9 | 4 | - |
| 2m=1060 | 35 | 35-4=9 | 386-35=11 | 40 | +5 |
| 3m=1590 | 293 [386] | 386-4=97 | i.e., 1:10:100 | 400 | [+14] |

Interpretation:

Applying a Bradford distribution to the 1497 works cited in
 293 journals in JEL articles,

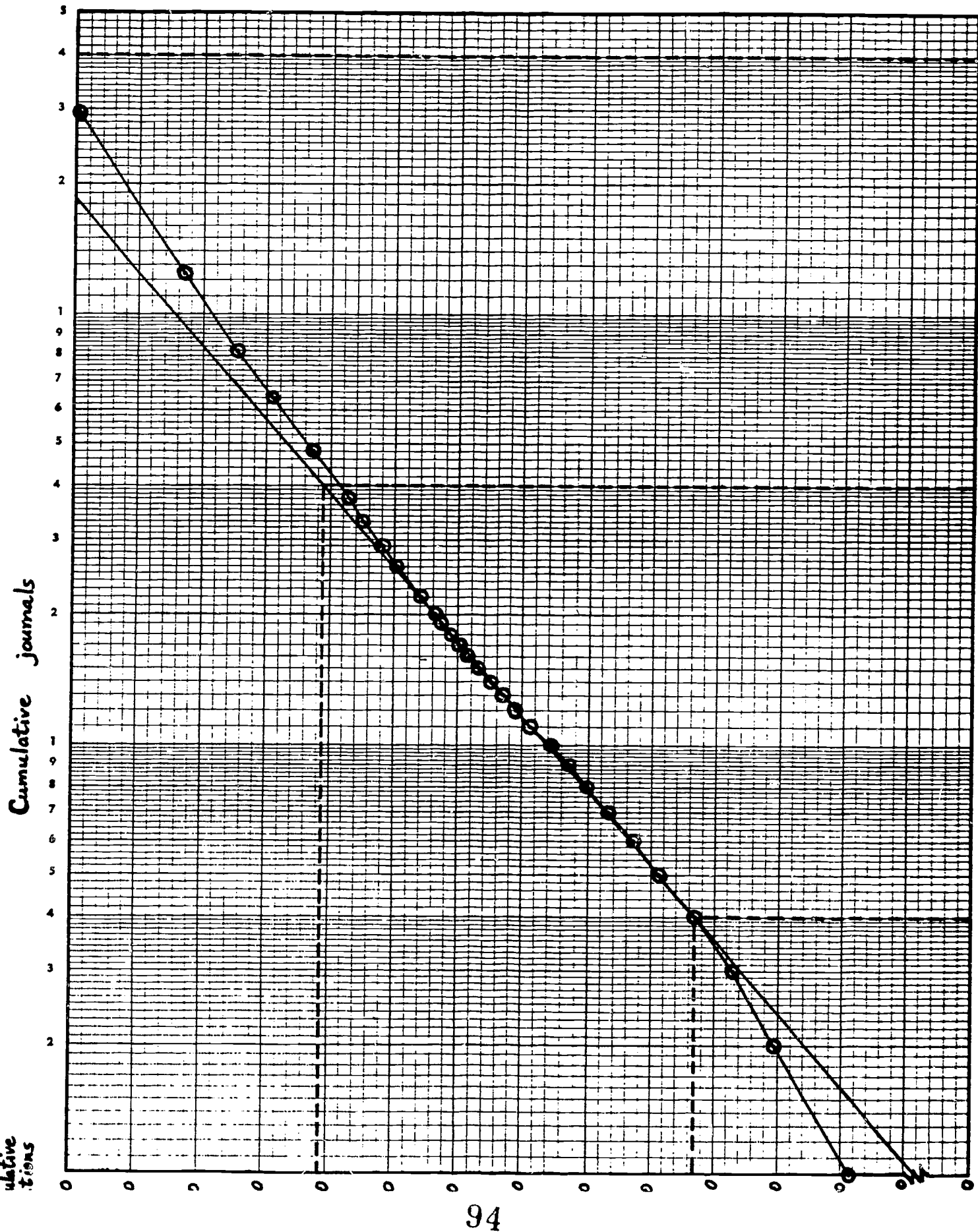
core(c)=4
 zone size(m)=530
 multiplier(n)=10

The core of 4 journals produced a nucleus of 530 citations.
 In order to add another 530 citations (i.e., zone 1) would
 require the output of an additional 31 journals.
 In order to add another 530 citations (i.e., zone 2) would
 require the output of an additional (and hypothetical) 347
 journals.

One may conclude that the 4 journals in the core are by far the
 most valuable to the producers of this literature.
 They are: JEL, LJ, AL, and CRL.

With c=4, the core is small and manageable.
 With m=530, there is a relatively large nucleus of citations but
 still an acceptable range of diversity.
 However, when n=10 (i.e., 10 is the Bradford multiplier), there is
 a large scatter in this literature. The series is 1: 10: 100.
 Multiplying anything by 10 begins to give very large numbers.

Table 18. Graphical Representation of a Bradford Distribution applied to Journal Citations in JEL Articles, 1960-1983



APPENDIX VI

PROJECT COSTS

Expenditures*

| | | |
|----------------------|-----------|----------------|
| Database preparation | (200 hrs) | \$2,160. |
| coding | (90 hrs) | |
| entry | (80 hrs) | |
| editing | (30 hrs) | |
| Text processing | (155 hrs) | \$1,670. |
| entry | (55 hrs) | |
| editing | (100 hrs) | |
| Computer costs | | \$1,000. |
| Research and writing | (50 hrs) | \$ 540. |
| Research materials | | <u>\$ 180.</u> |
| Total | | \$5,550. |

Funding Sources

| | |
|---|-----------------|
| Association for Library and Information Science Education, Special Research Grant Award (\$1,000 U.S.) | \$1,240. |
| Small Faculties Endowment Fund - Support for the Advancement of Scholarship, University of Alberta | \$2,660. |
| Faculty of Library Science, University of Alberta | <u>\$1,650.</u> |
| Total | \$5,550. |

*excluding the Principal Investigator's time and office
overhead